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PRELIMINARY FOREST HABITAT TYPES OF WESTERN MONTANA, MAY 1972

by

Robert D. Pfister, Stephen F. Arno,
Richard C. Presby, and Bernard L. Kovalchik

USDA Forest Service, Intermountain Forest and Range
Experiment Station and Region 1

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PRELIMINARY FOREST HABITAT TYPES OF WESTERN MONTANA, MAY 1972[1/]

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INTRODUCTION

Foresters in Montana have been using the Daubenmires' (1968) northern Idaho and eastern Washington habitat types the past few years with varying degrees of success or frustration. Since extrapolation was always somewhat uncertain, a cooperative study to develop a classification of the forest habitat types in Montana was initiated. Field reconnaissance commenced in June 1971.

Crew leaders (Arno, Presby, and Kovalchik) sampled mature forest stands on a wide variety of environments throughout the summer according to a standardized approach spelled out in the study plan. Data from previous studies on forest vegetation were obtained and included in the analyses wherever possible and appropriate.[2/]

FIELD METHODS

Mature stands were sampled along elevational transect at selected locations throughout western Montana in an attempt to sample a full range of environmental conditions. Sampling was conducted on temporary 1/10-acre circular plots, referenced for possible revisitation during conduct of the study. In each stand, a tally of tree species by 2-inch d.b.h. classes was completed, amounts of all plant species were estimated by seven canopy-coverage classes, and a relatively free-growing tree of each tree species was measured for height, age, d.b.h. in order to estimate site potential by species. Observations were made on fire history, insect and disease occurrence, animal use, and position of the stand in relation to adjoining habitats. Soil samples were collected from the upper 2 decimeters (8 inches).

[1/] This report was prepared for a R-1 Habitat Type Training Session, May 22-26, 1972 at Missoula, Montana. It presents a preliminary classification for four National Forests in western Montana. It is the first major step in a cooperative R1-INT study to develop a classification of forest habitat types in Montana.

[2/] The assistance of Dr. James R. Habeck, University of Montana, in sharing data from his studies in western Montana is gratefully acknowledged.

OFFICE METHODS

Following completion of the field work, several steps were involved in developing the preliminary classification.

Step 1 - Subjective, first approximation - Immediately following the field season, we constructed a first approximation of possible types based on our field observations. Daubenmires' (1968) types that had been encountered were listed. New situations, not meeting their descriptions, were described briefly and given tentative names. This process resulted in identification of 60 possible habitat types or phases.

Step 2 - BLM inventory plots - Richard Betts, of the Missoula District, BLM, worked with us on a tentative grouping of their inventory plots in the Garnet Range. This provided us the opportunity of looking at checklists from 200 plots immediately adjacent to the area of the study. It was also helpful in testing some of our tentative types developed in step 1.

Step 3 - Ordination of stands based on similarities and dissimilarities - By December, species identification and verification had been completed to the point that vegetative data analyses could be conducted.[3/] Data from 656 stands were key-punched for ADP analysis. The Regional Office converted an existing ordination program for use on the CDC - 3100. Ordination provided the opportunity to quantitatively express the similarity and dissimilarity between stands and to array the stands on this basis. Due to the large number of stands, stands were grouped by climax tree species prior to analysis. Plotting of individual species distribution allowed us to check for possible logical grouping of stands most similar into tentative associations.

Step 4 - Comparison of the first approximation and ordinations - The ordination results and the first approximation were compared to develop a second approximation of the types and phases.

Step 5 - Type description - A brief description of key vegetational parameters for these types and phases was prepared. From this a key to the types was constructed. Constancy and average coverage values for the important indicator plants were calculated as an aid in reviewing the proposed classification.

Step 6 - Verification and adjustments - All sample stands used in the analyses were then checked against the key and the type descriptions. Several revisions in the type descriptions were

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3/ The services of Peter Stickney, Range Ecologist, Intermountain Station, Missoula, in plant identification are gratefully acknowledged.

made to accommodate the actual stand data. Terminology for the types was corrected to compare as directly as possible with the Daubenmires' (1968) system and to express the interrelationships of our types as clearly as possible. The phase was used as a classification unit to subdivide habitat types where appropriate. In some cases a phase represents a broad transition between two adjacent habitat types. In other cases, a phase represents a difference of vegetation dominance in a third layer, whereas the habitat type is defined by dominants in two layers. Constancy and average cover values were recalculated for the important indicator plants following these adjustments (Table 3). A complete presence list was prepared for all species represented in at least five stands to allow further evaluation of the distribution of any species of interest (Table 4).

Step 7 - Summary of site data - All aspect, elevation, topography and slope data were summarized by the h.t.s and phases to aid in describing the location and general environmental characteristics of each type.

Step 8 - Summary of management implications - Site index data (Table 5), lodgepole pine serotiny, dwarfmistletoe (Table 6), budworm, and fire history data were summarized by h.t.s and phases.

Step 9 - Type descriptions - A brief synopsis was prepared for each defined habitat type, highlighting key characteristics of the type. This includes a generalized description of the physical environmental features and location of the habitats, the key vegetational features, the descriptions of phases and basis for separation, and a few implications for management.

Step 10 - Species illustration - The species added to the checklist (Form R1-2410-15H) that were not included in previous reference material (USDA, Forest Service, 1971) are presented in Appendix A. 1/

Step 11 - Photographs of types - Colored photos were available for over 400 stands. Those best illustrating physiognomy of the different associations were selected and are reproduced in black and white in Appendix B.

1/ Illustrations were copied from the taxonomic reference, by permission of the author, for use as aids in learning to identify the key species needed to determine habitat types. The taxonomic referenced used for the illustrations was:

Hitchcock, C. Leo et. al 1955-1969
Vascular plants of the Pacific Northwest: Five Volumes, University of Washington Press, Seattle and London, illus. Drawings by Jeanne R. Janish.

RESULTS

A complete verbal account of results is not attempted herein. Instead, the basic features of the classification have been arranged in a logical order for purposes of training and utility for immediate application to the Bitterroot, Lolo, Flathead and Kootenai National Forests, and adjoining land of other ownerships.

The preliminary classification (page 6) is presented on one page for an overall view of the types. Accompanying it are a list of the abbreviations commonly used throughout this report and the apparent relationship to the previous system used in western Montana (Daubenmires' 1968). Numerical codes have been assigned to the types for EDP analyses in a format compatible with the previous numbering system.

A new field form (R1-2410-15H) was prepared to enable collection of the minimum data needed for identification of the types and phases. This form is designed for the four western Montana National Forests.

The key to habitat types (pages 8-11) was simplified for utility, basing distinctions on single key criteria wherever possible. Accessory tables and type descriptions will aid in confirming identifications or for placing problem stands.

The distribution of reconnaissance plots (Table 1) portrays a general idea of geographic representation of the types and phases in western Montana.

The distribution of tree species (Table 2) is an interpretive tabulation of tree species occurrence in defined types and phases. This provides the basic information for selection of tree species based on their environmental adaptation to specific habitats.

Constancy and average coverage data (Table 3) are useful for understanding the major vegetative criteria used to develop the new classification. Comparison of the types based upon this compositional information provides for an understanding of the classification that cannot be gained simply by using the key.

Presence summaries (Table 4) are provided for those interested in a more detailed distribution of plant species among the types and phases.

The summary of basal area and site indexes (Table 5) allows one to make an overall evaluation of relative productivity by types. The best site tree of each species represented in a stand was selected. Therefore, the values represent our best current estimate of potential sites. The values should be used for relative productivity considerations, not for absolute values at this time. Site indexes were taken from the current R-1 2410 curves on a 50-year age base. Means were calculated only if n was 3 or greater. Confidence intervals (95%) for estimation of the mean were calculated if n=5 or more.

The observance of dwarfmistletoe in Douglas-fir and western larch (Table 6) is presented in summary form. Apparent correlations with h.t. are indicated in the table.

The habitat type descriptions (pages 29-69) are arranged by "series," based upon the climax tree species; series is the primary subdivision in the classification system. Descriptions of types are intentionally brief and will be expanded (within 2 years) upon completion of the study.

The management implications are also brief at this time. Some of our observations could not be completely evaluated prior to the training session. Further management implications can be developed by other studies related to this classification framework. For the present, the management implications prepared for last year's training session (Pfister, et al. 1971) can be used for those types similar to the Daubenmires' (1968) types. For the new types, new management implications must be developed separately.

The types presented in this report are preliminary. Following completion of reconnaissance sampling in the remainder of Montana, central and eastern Idaho and northeastern Wyoming, the types will be re-evaluated in relation to adjoining areas. From this large data base, a comprehensive overall classification of forest habitat types in the northern Rocky Mountains can be completed and presented as one unified package. Your assistance can greatly aid in completion of this project and in the accuracy of the final system. Any stands not fitting in this classification framework need to be considered in the final classification. For any stands that fit poorly into this classification, please complete the checklist (Form R1-2410-15H), including stand location, and send this information to us. We will try to pinpoint the problem in classifying the particular stand, and will, if necessary, consider it when revising the classification system. The users of this system are, in effect, testing its applicability and any feedback, positive or negative will be appreciated.

PRELIMINARY HABITAT TYPE CLASSIFICATION
(List of habitat types & phases, abbreviations, & relationship to Daubenmire (1968) habitat types)

Habitat Types & Phases	EDP CODE	Abbreviations	Relationships
1. Pinus ponderosa &-or Pseudotsuga menziesii/scree	(09)	1. PP &-or DF/scree	1. new
A. Pinus Ponderosa Climax Series			
2. Pinus ponderosa/Agropyron spicatum h.t.	(10)	2. PP/Agsp h.t.	2. about equal (=)
3. Pinus ponderosa/Festuca idahoensis h.t.	(11)	3. PP/Feid h.t.	3. broader
a. Festuca idahoensis phase		a. Feid phase	a. about =
b. Festuca scabrella phase		b. Fesc phase	b. new
4. Pinus ponderosa/Purshia tridentata h.t.	(12)	4. PP/Putr h.t.	4. about =
a. Agropyron spicatum phase		a. Agsp phase	a. mentioned in text
b. Festuca idahoensis phase		b. Feid phase	b. mentioned in text
c. Arctostaphylos uva-ursi phase		c. Aruv phase	c. new
5. Pinus ponderosa/Symphoricarpos albus h.t.	(14)	5. PP/Syal h.t.	5. about =
6. Pinus ponderosa/Calamagrostis rubescens h.t.	(16)	6. PP/Caru h.t.	6. new
B. Pseudotsuga Menziesii Climax Series			
7. Pseudotsuga menziesii/Agropyron spicatum h.t.	(20)	7. DF/Agsp h.t.	7. new
8. Pseudotsuga menziesii/Calamagrostis rubescens h.t.	(23)	8. DF/Caru h.t.	8. broader
a. Calamagrostis rubescens phase		a. Caru phase	a. = to DF/Caru
b. Agropyron spicatum phase		b. Agsp phase	b. new
9. Pseudotsuga menziesii/Arctostaphylos uva-ursi h.t.	(24)	9. DF/Aruv h.t.	9. = to DF/Caru-Aruv phase
10. Pseudotsuga menziesii/Vaccinium caespitosum h.t.	(25)	10. DF/Vaca h.t.	10. new
11. Pseudotsuga menziesii/Symphoricarpos albus (+Caru) h.t.	(22)	11. DF/Syal h.t.	11. broader
a. Symphoricarpos albus phase		a. Syal phase	a. like DF/Syal but with much Caru
**b. Agropyron spicatum phase		b. Agsp phase	b. new
12. Pseudotsuga menziesii/Physocarpos malvaceus h.t.	(21)	12. DF/Phma h.t.	12. broader
a. Physocarpos malvaceus phase		a. Phma phase	a. =to DF/Phma
**b. Arctostaphylos uva-ursi phase		b. Aruv phase	b. new
13. Pseudotsuga menziesii/Linnaea borealis h.t.	(26)	13. DF/Libo h.t.	13. new
a. Calamagrostis rubescens phase		a. Caru phase	a.
b. Symphoricarpos albus phase		b. Syal phase	b.
14. Pseudotsuga menziesii/Xerophyllum tenax h.t.	(27)	14. DF/Xete h.t.	14. new
a. Xerophyllum tenax phase		a. Xete phase	a.
b. Arctostaphylos uva-ursi phase		b. Aruv phase	b.
C. Picea Climax Series			
15. Picea/Linnaea borealis h.t.	(81)	15. S/Libo h.t.	15. new
D. Abies Grandis Climax Series			
16. Abies grandis/Clintonia uniflora h.t.	(36)	16. GF/Clun h.t.	16. broader
a. Clintonia uniflora phase		a. Clun phase	a. = to GF/Pamy
b. Xerophyllum tenax phase		b. Xete phase	b. new
17. Abies grandis/Xerophyllum tenax h.t.	(37)	17. GF/Xete h.t.	17. new
E. Tsuga heterophylla &-or Thuja plicata Climax Series			
18. Thuja plicata/Clintonia uniflora h.t.	(44)	18. WRC/Clun h.t.	18. broader
a. Clintonia uniflora phase		a. Clun phase	a. subdivision of WRC/Pamy
b. Gymnocarpium dryopteris phase		b. Gydr phase	b. subdivision
c. Menziesia ferruginea phase		c. Mefe phase	c. new
19. Tsuga heteraphylla/Clintonia uniflora h.t.	(52)	19. WH/Clun h.t.	19. broader
a. Clintonia uniflora phase		a. Clun phase	a. subdivision
b. Gymnocarpium dryopteris phase		b. Gydr phase	b. subdivision
c. Xerophyllum tenax phase		c. Xete phase	c. new
20. Tsuga heterophylla/Oplopanax horridum h.t.	(53)	20. WH/Opho h.t.	20. name change reflecting WH dominance
F. Abies Lasiocarpa (+Tsuga Mertensiana) Climax Series			
21. Abies lasiocarpa/Clintonia uniflora h.t.	(71)	21. AF/Clun h.t.	21. broader
a. Clintonia uniflora phase		a. Clun phase	a. subdivn.of AF/Pamy
b. Vaccinium caespitosum phase		b. Vaca phase	b. new
c. Xerophyllum tenax phase		c. Xete phase	c. new
d. Aralia nudicaulis phase		d. Armu phase	d. new
e. Menziesia ferruginea phase		e. Mefe phase	e. subdivn.of AF/Pamy
22. Abies lasiocarpa/Oplopanax horridum h.t.	(76)	22. AF/Opho h.t.	22. new
23. Abies lasiocarpa/Vaccinium scoparium h.t.	(75)	23. AF/Vasc h.t.	23. about =
24. Abies lasiocarpa/Xerophyllum tenax h.t.	(73)	24. AF/Xete h.t.	24. part of AF/Xete
a. Xerophyllum tenax phase		a. Xete phase	a. subdivn.
b. Calamagrostis rubescens phase		b. Caru phase	b. subdivn.
25. Tsuga mertensiana/Xerophyllum tenax h.t.	(54)	25. MH/Xete h.t.	25. about =
26. Abies lasiocarpa/Menziesia ferruginea h.t.	(74)	26. AF/Mefe h.t.	26. part of AF/Mefe
27. Tsuga mertensiana/Menziesia ferruginea h.t.	(55)	27. MH/Mefe h.t.	27. about =
28. Abies lasiocarpa/Luzula glabrata h.t.	(77)	28. AF/Lugl h.t.	28. new
a. Vaccinium scoparium phase		a. Vasc phase	a. part of AF/Xete
b. Menziesia ferruginea phase		b. Mefe phase	b. part of AF/Mefe
G. Timberline Climax Series			
29. Pinus albicaulis-Abies lasiocarpa h.t.	(66)	29. WBP-AF h.t.	29. about =
30. Larix lyallii-Abies lasiocarpa h.t.	(67)	30. AL-AF h.t.	30. new

**problem phases for management that should be mapped & recognized as distinct from the pure phases for these habitat types.

USDA-FOREST SERVICE

WESTERN MONTANA HABITAT TYPE FIELD FORM | NAME | DATE

(CODE DESCRIPTION)

TOPOGRAPHY: 1-RIDGE, 2-UPPER SLOPE, 3-MID SLOPE, 4-LOWER SLOPE, 5-BENCH OR FLAT, 6-STREAMBOTTOM

HORIZONTAL CONFIGURATION: 1-CONVEX (DRY), 2-STRAIGHT, 3-CONCAVE (WET), 4-UNDULATING

VEGETATION COVERAGE: CLASS (%): 0-NONE, T-RARE TO 1%, 1-1 TO 5, 2-5 TO 25, 3-25 TO 50, 4-50 TO 75, 5-75 TO 95, 6-95 TO 100

PLOT NO			
LOC			
T,R,S			
ELEV			
ASPECT			
SLOPE	%	%	%
TOPOG			
CONFIG			

NOTE: RATE TREES (> 4") AND REG. 0-4" SEPARATELY (E.G. 4/2)

TREES — SCIENTIFIC NAMES	COMMON NAMES			
1. ABIES GRANDIS	GRAND FIR			
2. ABIES LASIOCARPA	SUBALPINE FIR			
3. BETULA PAPYRIFERA	PAPER BIRCH			
4. LARIX OCCIDENTALIS	WESTERN LARCH			
5. PICEA	SPRUCE			
6. PINUS ALBICAULIS	WHITEBARK PINE			
7. PINUS CONTORTA	LODGEPOLE PINE			
8. PINUS MONTICOLA	WESTERN WHITE PINE			
9. PINUS PONDEROSA	PONDEROSA PINE			
10. PSEUDOTSUGA MENZIESII	DOUGLAS-FIR			
11. THUJA PLICATA	WESTERN REDCEDAR			
12. TSUGA HETEROPHYLLA	WESTERN HEMLOCK			
13. TSUGA MERTENSIANA	MOUNTAIN HEMLOCK			
SHRUBS				
14. ARCTOSTAPHYLOS UVA-URSI	KINNIKINNIC			
15. HOLODISCUS DISCOLOR	OCEAN SPRAY			
16. LINNAEA BOREALIS	TWIN FLOWER			
17. MENZIESIA FERRUGINEA	MENZIESIA			
18. OPLOPANAX HORRIDUM	DEVIL'S CLUB			
19. PHYLLODOCE	MOUNTAIN HEATH			
20. PHYSOCARPUS MALVACEUS	NINEBARK			
21. PURSHIA TRIDENTATA	BITTERBRUSH			
22. SPIRAEA BETULIFOLIA	WHITE SPIREA			
23. SYMPHORICARPOS ALBUS	SNOWBERRY			
24. VACCINIUM CAESPITOSUM	DWARF HUCKLEBERRY			
25. VACCINIUM MEMBRANACEUM	THINLEAVED HUCKLEBERRY			
26. VACCINIUM SCOPARIUM	GROUSE WHORTELBERRY			
PERENNIAL GRAMINOIDS				
27. AGROPYRON SPICATUM	BLUEBUNCH WHEATGRASS			
28. BROMUS VULGARIS	COLUMBIA BROME			
29. CALAMAGROSTIS RUBESCENS	PINEGRASS			
30. CAREX GEYERII	ELK SEDGE			
31. FESTUCA IDAHOENSIS	IDAHO FESCUE			
32. FESTUCA SCABRELLA	ROUGH FESCUE			
33. LUZULA GLABRATA	WOOD-RUSH			
34. MELICA SUBULATA	ALASKA ONIONGRASS			
35. ORYZOPSIS ASPERIFOLIA	ROUGHLEAF RICEGRASS			
PERENNIAL FORBS & FERNS				
36. ARALIA NUDICAULIS	WILD SARSAPARILLA			
37. ATHYRIUM FILIX-FEMINA	LADY FERN			
38. BALSAMORHIZA SAGITTATA	ARROWLEAF BALSAMROOT			
39. CHIMAPHILA UMBELLATA	PRINCE'S PINE			
40. COPTIS OCCIDENTALIS	GOLDTHREAD			
41. CLINTONIA UNIFLORA	QUEEN CUP BEADLILY			
42. GALIUM TRIFLORUM	SWEETSCENTED BEDSTRAW			
43. GYMNOCARPIUM DRYOPTERIS	OAK FERN			
44. TIARELLA UNIFOLIATA	FOAMFLOWER			
45. TRILLIUM OVATUM	TRILLIUM			
46. VIOLA ORBICULATA	ROUND-LEAVED VIOLET			
47. XEROPHYLLUM TENAX	BEARGRASS			

Key to Western Montana Forest

Habitat-Types* 5/1/72

1. Habitats on steep slopes (30+ deg.) composed primarily of fine rock; understory vegetation sparse, poorly developed, and variable . .
PINUS PONDEROSA or PSEUDOTSUGA MENZIESII/"SCREE" H.T. (p.29)

1. Habitats on sites with some soil development; understory vegetation rather well developed and somewhat uniform . . .

2. Pinus ponderosa (& Juniperus scopulorum) the only coniferous trees present; or Pseudotsuga menziesii present but not reproducing successfully enough because of dry conditions to replace Pinus ponderosa at climax.

3. Purshia tridentata well represented* . PINUS PONDEROSA/PURSHIA TRIDENTATA H.T. (p.3

3. Purshia tridentata poorly represented*

4. Symphoricarpos albus and/or Spiraea betulifolia the dominant understory . PINUS PONDEROSA/SYMPHORICARPOS ALBUS H.T. (p.34)

4. Grasses and forbs the dominant undergrowth.

5. Calamagrostis rubescens well represented . .
PINUS PONDEROSA/CALAMAGROSTIS RUBESCENS H. (p.35

5. Calamagrostis rubescens poorly represented

6. Festuca idahoensis and/or F. scabrella well represented . PINUS PONDEROSA/FESTUCA IDAHOENSIS H.T. (p.31

6. Festuca spp. poorly represented; Agropyron spicatum the dominant grass . .
PINUS PONDEROSA/AGROPYRON SPICATUM H.T. (p.30

2. Coniferous trees other than Pinus ponderosa (& Juniperus scopulorum) present and apparently reproducing well enough to replace Pinus at climax.

*General criteria for term definitions: "well represented"=greater than 5% coverage (crown covg. of ground surface); "poorly represented"=absent or less than 5% covg.; "scarce"=coverage less than 1%.

7. Pseudotsuga menziesii the indicated climax species; Picea, Abies, Thuja, and Tsuga absent or scarce and not reproducing vigorously (less than 10 trees/acre in old-growth stands).

8. Vaccinium caespitosum present . PSEUDOTSUGA MENZIESII/ VACCINIUM CAESPITOSUM H.T. (p.40)

8. Vaccinium caespitosum absent

9. Bunchgrass union (Agropyron spicatum, Festuca idahoensis, Balsamorhiza, etc.) the dominant undergrowth in undisturbed, old-growth stands . PSEUDOTSUGA MENZIESII/AGROPYRON SPICATUM H.T. (p.36)

9. Bunchgrass union not dominant.

10. Xerophyllum and/or Vaccinium membranaceum well represented PSEUDOTSUGA MENZIESII/XEROPHYLLUM TENAX H.T. (p.47)

10. Xerophyllum and Vaccinium membranaceum poorly represented

11. Physocarpus and/or Holodiscus well represented PSEUDOTSUGA MENZIESII/PHYSOCARPUS MALVACEUS H.T. (p.43)

11. Physocarpus and Holodiscus poorly represented

12. Linnaea borealis well represented and/or Clintonia or Galium triflorum present . . PSEUDOTSUGA MENZIESII/LINNAEA BOREALIS H.T. (p.45)

12. Linnaea poorly represented and Clintonia and Galium triflorum absent.

13. Symphoricarpos and/or Spiraea betulifolia at least codominant with Calamagrostis rubescens, Carex geyeri, and Arctostaphylos . . PSEUDOTSUGA MENZIESII/SYMPHORICARPOS ALBUS H.T. (p.41)

13. Calamagrostis rubescens, Carex geyeri, and/or Arctostaphylos the dominant vegetation.

14. Arctostaphylos present (not scarce) . . PSEUDOTSUGA MENZIESII/ARCTOSTAPHYLOS UVA-URSI H.T. (p.39)

14. Arctostaphylos scarce or absent . . PSEUDOTSUGA MENZIESII/CALAMAGROSTIS RUBESCENS H.T. (p.37)

7. Conifers other than Pseudotsuga (i.e., Picea, Abies, Thuja, or Tsuga) present and reproducing successfully.

15. Picea or Picea and Pseudotsuga the only indicated climax species . . PICEA/LINNAEA BOREALIS H.T. (p.49)

15. Conifers other than Picea and Pseudotsuga present and reproducing

16. Abies grandis the indicated climax species.

    17. Clintonia and/or Galium triflorum present, or Coptis occidentalis present and not scarce. . ABIES GRANDIS/CLINTONIA UNIFLORA H.T. (p.50)

    17. Clintonia and Galium triflorum absent and Coptis scarce; Xerophyllum, Vaccinium membranaceum, Pyrola spp., and Chimaphila the dominant understory. . . . ABIES GRANDIS/XEROPHYLLUM TENAX H.T. (p.52)

16. Conifers other than Abies grandis the indicated climax species.

    18. Tsuga heterophylla present and reproducing successfully

        19. Oplopanax well represented . TSUGA HETEROPHYLLA/OPLOPANAX HORRIDUM H.T. (p.56)

        19. Oplopanax poorly represented TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA H.T. (p.55)

    18. Tsuga heterophylla absent or not reproducing successfully.

        20. Thuja plicata present and reproducing successfully . . THUJA PLICATA/CLINTONIA UNIFLORA H.T. (p.53)

        20. Thuja plicata absent or not reproducing successfully.

            21. Oplopanax well represented or Athyrium abundant and two or more feet tall . ABIES LASIOCARPA/OPLOPANAX HORRIDUM H.T. (p.59)

            21. Oplopanax poorly represented and Athyrium not abundant or two feet tall.

                22. Clintonia and/or Galium triflorum present, or Coptis occidentalis present and not scarce . . ABIES LASIOCARPA/CLINTONIA UNIFLORA H.T. (p.57)

                22. Clintonia and Galium triflorum absent, and Coptis scarce.

                    23. Timberline habitats; Abies lasiocarpa dwarfed and wind-deformed; Menziesia and Pinus contorta absent.

                        24. Larix lyallii present in old-growth stands. LARIX LYALLII-ABIES LASIOCARPA H.T. (p.68)

                        24. Larix lyallii absent from old-growth stands. PINUS ALBICAULIS-ABIES LASIOCARPA H.T. (p.68)

                    23. Forest habitats; Abies lasiocarpa tall, not wind-deformed; Menziesia and/or Pinus contorta often present in vicinity.

                        25. Luzula glabrata present; sites usually above elevational limits of Pseudotsuga, Larix occidentalis, and Pinus monticola . . ABIES LASIOCARPA/LUZULA GLABRATA H.T. (p.66)

25. Luzula glabrata absent; sites usually not above cold limits of Pseudotsuga, Larix occidentalis, and Pinus monticola . .

    26. Tsuga mertensiana at least codominant with Abies lasiocarpa and reproducing successfully.

        27. Menziesia and/or Rhododendron well represented . . TSUGA MERTENSIANA/MENZIESIA FERRUGINEA H.T. (p.65)

        27. Menziesia and Rhododendron poorly represented . . TSUGA MERTENSIANA/XEROPHYLLUM TENAX H.T. (p.63)

    26. Abies lasiocarpa clearly dominant over Tsuga mertensiana or the latter not reproducing successfully.

        28. Menziesia and/or Rhododendron well represented . . ABIES LASIOCARPA/MENZIESIA FERRUGINEA H.T. (p.64)

        28. Menziesia and Rhododendron poorly represented

            29. Vaccinium scoparium clearly dominant over Xerophyllum and Vaccinium membranaceum . ABIES LASIOCARPA/VACCINIUM SCOPARIUM H.T. (p.60)

            29. Vaccinium scoparium not clearly dominant over Xerophyllum and Vaccinium membranaceum . ABIES LASIOCARPA/XEROPHYLLUM TENAX H.T. (p.61)

Table 1.--
Distribution of Reconnaissance Plots, by Habitat Type and Phase, in the Vicinity of Western Montana National Forests.

(K=Kootenai N.F.; F=Flathead; WL=West Lolo, R.20 or more W.; EL=East Lolo; B=Bitterroot)

HABITAT TYPES & PHASES	National Forest Vicinity					
	K	F	WL	EL	B	TOTAL
PP &-or DF/"Scree" h.t.	-	-	2	3	3	8
PP (+DF) CLIMAX SERIES						
PP/Agsp h.t.	-	1	5	4	2	12
PP/Feid h.t.: Feid phase	1	-	2	1	10	14
Fesc phase	-	2	3	1	-	6
PP/Putr h.t.: Agsp phase	2	-	-	-	2	4
Feid phase	1	-	1	-	2	4
Aruv phase	3	-	-	-	1	4
PP/Syal h.t.	-	-	2	-	2	4
PP/Caru h.t.	1	2	-	1	1	5
DF CLIMAX SERIES						
DF/Agsp h.t.	3	1	-	1	-	5
DF/Caru h.t. Caru phase	2	1	1	12	4	20
Agsp phase	1	-	2	1	2	6
DF/Aruv h.t.	3	-	1	2	6	12
DF/Vaca h.t.	7	1	5	2	-	15
DF/Syal (+Caru) h.t.						
Syal phase	1	8	2	3	11	25
Agsp phase	-	-	3	2	4	9
DF/Phma h.t. Phma phase	2	4	7	10	6	29
Aruv phase	-	-	2	2	3	7
DF/Libo h.t. Caru phase	1	-	1	1	1	4
Syal phase	2	-	1	2	-	5
DF/Xete h.t. Xete phase	1	2	11	7	4	25
Aruv phase	-	-	6	3	4	13
SPRUCE CLIMAX SERIES						
S/Libo h.t.	7	11	-	1	-	19
GF CLIMAX SERIES						
GF/Clun h.t. Clun phase	1	6	3	-	3	13
Xete phase	1	2	1	-	-	4
GF/Xete h.t.	-	-	2	-	1	3
WRC &/or WH CLIMAX SERIES						
WRC/Clun h.t. Clun phase	3	7	4	1	-	15
Gydr phase	-	2	3	1	-	6
Mefe phase	1	3	3	1	-	8
WH/Clun h.t. Clun phase	6	9	1	-	-	16
Gydr phase	-	14	1	-	-	15
Xete phase	2	4	-	-	-	6
WH/Opho h.t.	3	7	-	-	-	10

HABITAT TYPES & PHASES		National Forest Vicinity					
		K	F	WL	EL	B	TOTAL
AF(+MH) CLIMAX SERIES							
AF/Opho h.t.		1	4	-	-	1	6
AF/Clun h.t.	Clun phase	2	3	3	6	8	22
	Vaca phase	-	10	-	1	1	12
	Xete phase	5	17	9	4	1	36
	Arnu phase	-	13	-	-	-	13
	Mefe phase	1	7	6	6	2	22
AF/Vasc h.t.		4	2	1	2	-	9
AF/Xete h.t.	Xete phase	2	6	14	4	5	31
	Caru phase	2	1	1	2	5	11
MH/Xete h.t.		1	-	4	-	-	5
AF/Mefe h.t.		2	2	15	9	8	36
MH/Mefe h.t.		1	-	6	1	-	8
AF/Lugl h.t.	Vasc phase	2	3	3	4	10	22
	Mefe phase	10	5	-	3	3	21
TIMBERLINE CLIMAX SERIES							
WBP-AF h.t.		1	1	1	4	1	8
AL-AF h.t.		2	3	-	-	25	30
TOTAL:		91	167	138	107	142	643

SOURCE OF SAMPLE PLOTS:

429 - sampled by Presby, Kovalchik, & Arno in summer 1971
20 - Pfister, Miller Cr. Study, Flathead
14 - Pfister, Newman Ridge, W. Lolo
8 - Pfister, Lubrecht, E. Lolo
3 - Pfister, Coram, Flathead
4 - Schmidt, Larch Spacing Study
12 - Daubenmire, Montana plots
84 - J. R. Habeck, W. Montana Studies
28 - Wayne Tree, Spruce-Fir Study, Missoula Co.
41 - S. Arno, *Larix lyallii* Study, forest-like stands
643

TABLE 2 - DISTIBUTION AND ROLES OF TREE SPECIES IN RELATIONSHIP TO HABITAT TYPE

Distribution of tree species through the series of habitat types, showing their dynamic status (C=major climax species;c=minor climax species;S=major seral;s=minor seral;a=accidentals;( )= in certain areas of the type) as interpreted from Western Montana Reconnaissance Plot data.

	RMJ	PP	DF	LP	WL	WS	GF	WP	WRC	WH	AF	ES	MH	WBP	AL	PB
PP or DF/Scree	(c)	(C)	(C)	-	-	-	-	-	-	-	-	-	-	(c)	-	-
PP/Agsp*	-	C	(c)	-	-	-	-	-	-	-	-	-	-	-	-	-
PP/Feid-Feid**	(c)	C	(c)	-	-	-	-	-	-	-	-	-	-	-	-	-
/Feid-Fesc	-	C	(c)	-	-	-	-	-	-	-	-	-	-	-	-	-
PP/Putr-Agsp	(c)	C	(c)	-	-	-	-	-	-	-	-	-	-	-	-	-
/Putr-Feid	-	C	(c)	-	-	-	-	-	-	-	-	-	-	-	-	-
/Putr-Aruv	-	C	(c)	-	-	-	-	-	-	-	-	-	-	-	-	-
PP/Syal	-	C	(c)	-	-	-	-	-	-	-	-	-	-	-	-	-
PP/Caru	(c)	C	c	-	-	-	-	-	-	-	-	-	-	-	-	-
DF/Agsp	(s)	(c)	C	-	-	-	-	-	-	-	-	-	-	-	-	-
DF/Caru-Agsp	(s)	S	C	-	-	-	-	-	-	-	-	-	-	-	-	-
DF/Syal-Agsp	(s)	S	C	-	-	-	-	-	-	-	-	-	-	-	-	-
DF/Caru-Caru	-	(s)	C	s	(s)	-	-	-	-	-	a	-	-	a	-	-
DF/Aruv	(s)	S	C	s	(s)	-	-	-	-	-	-	-	-	-	-	-
DF/Syal-Syal	-	S	C	(s)	(s)	-	-	-	-	-	-	-	-	-	-	-
DF/Phma-Aruv	(s)	S	C	(s)	(s)	-	-	-	-	-	-	-	-	-	-	-
/Phma-Phma	-	s	C	(s)	(s)	-	a	-	-	-	-	-	-	-	-	-
DF/Vaca	-	S	C	s	s	a	-	-	-	-	a	-	-	-	-	-
DF/Libo-Caru	-	s	C	S	S	a	a	-	-	-	a	a	-	-	-	-
/Libo-Syal	-	s	C	s	S	a	a	-	-	-	a	a	-	-	-	-
DF/Xete-Aruv	-	S	C	s	s	-	a	-	-	-	a	-	-	-	-	-
/Xete-Xete	-	(s)	C	s	s	-	a	a	-	-	a	-	-	a	-	-
S/Libo	-	s	(C)	S	S	(C)	(c)	a	-	-	a	(c)	-	-	-	(s)
GF/Xete	-	s	S	s	S	-	C	-	-	-	a	a	-	-	-	-
/Clun-Xete	-	s	S	s	S	-	C	(s)	a	a	a	(s)	-	-	-	(s)
/Clun-Clun	-	s	S	s	s	(s)	C	(s)	a	a	a	(s)	-	-	-	(s)
WRC/Clun-Clun	-	a	S	s	S	(s)	(c)	(s)	C	a	(c)	s	-	-	-	(s)
/Clun-Gydr	-	-	s	-	s	-	s	(s)	C	a	(c)	s	-	-	-	(s)
/Clun-Mefe	-	-	S	s	s	-	s	(S)	C	a	c	S	-	-	-	(s)
WH/Clun-Xete	-	-	s	s	s	(s)	s	S	c	C	(c)	(s)	-	-	-	(s)
/Clun-Clun	-	a	s	s	S	(s)	S	S	c	C	(c)	(s)	-	-	-	(s)
/Clun-Gydr	-	-	s	-	s	(s)	(s)	s	c	C	(c)	a	-	-	-	(s)
WH/Opho	-	-	a	-	a	(s)	a	s	(C)	(C)	(s)	(s)	-	-	-	(s)
AF/Opho	-	-	s	-	S	-	(s)	(S)	a	a	C	S	-	-	-	(s)
AF/Clun-Vaca	-	s	S	S	s	(s)	a	(s)	a	a	C	(s)	-	-	-	-
/Clun-Xete	-	-	S	s	S	-	(s)	(S)	a	a	C	S	(s)	a	-	-
/Clun-Arnu	-	-	s	a	S	(S)	a	s	-	a	C	(S)	-	-	-	S
/Clun-Clun	-	s	S	s	S	(s)	(s)	(s)	a	a	C	S	-	-	-	-
/Clun-Mefe	-	-	S	s	S	-	(S)	a	a	a	C	S	-	a	-	-
AF/Vasc	-	-	s	S	(s)	-	a	(s)	-	-	C	s	a	a	-	-
AF/Xete-Caru	-	s	S	S	(s)	-	a	a	-	-	C	a	a	a	-	-
/Xete-Xete	-	-	S	S	(s)	-	a	(s)	-	-	C	s	(c)	(s)	-	-
MH/Xete	-	-	a	S	s	-	a	(s)	-	-	c	s	C	(s)	-	-
AF/Mefe	-	-	S	S	s	-	-	(s)	a	-	C	S	(c)	(s)	-	-
MH/Mefe	-	-	(s)	s	s	-	-	(s)	-	-	C	s	C	(s)	-	-
AF/Lugl-Vasc	-	-	a	S	-	-	-	-	-	-	C	s	(c)	S	a	-
/Lugl-Mefe	-	-	-	(s)	-	-	-	-	-	-	C	S	(c)	s	(s)	-
WBP-AF	-	-	-	-	-	-	-	-	-	-	(C)	(c)	-	(C)	-	-
AL-AF	-	-	-	-	-	-	-	-	-	-	(C)	(c)	-	(C)	(C)	-
	RMJ	PP	DF	LP	WL	WS	GF	WP	WRC	WH	AF	ES	MH	WBP	AL	PB

* first abbreviation in understory union is the habitat type

** second abbreviation in understory union is the phase

Table 3

Constancy and (Average Coverage %) of Important Understory Plants in Western Montana Forest Habitat Types and Phases. (5-8-72)

	PP &-or DF/ "Scree" h.t.	PONDEROSA PINE (+ DOUGLAS-FIR) CLIMAX SERIES							
		PP/Agsp h.t.	PP/Feid h.t.		PP/Purshia tridentata h.t.			PP/Syal h.t	PP/Caru h.t.
			Feid phase	Fesc phase	Agsp phase	Feid phase	Aruv phase		
No. of Stands:	N=8	N=12	N=14	N=6	N=4	N=4	N=4	N=4	N=5
Agropyron spicatum	8 (8)	10 (24)	9 (14)	10 (20)	10 (23)	8 (8)	3	8 (8)	8 (9)
Festuca idahoensis	5	8 (2)	10 (18)	10 (6)	8 (2)	10 (38)	3 (4)	8 (4)	10 (13)
Carex geyeri	8 (3)	3	1 (1)	2	-	-	3 (4)	3 (4)	4 (8)
Balsamorhiza sagittata	8 (2)	9 (9)	9 (11)	10 (10)	5 (1)	10 (23)	3	8 (8)	8 (11)
Physocarpus malvaceus	3 (2)	1	1	2 (2)	-	-	-	-	2
Spiraea betulifolia	5 (2)	2	2	-	-	3 (1)	10 (20)	5 (10)	4
Symphoricarpos albus	4 (2)	4	4 (4)	3 (3)	5	3 (1)	8 (8)	10 (46)	2
Arctostaphylos uva-ursi	4 (2)	-	-	-	5	-	10 (39)	-	4
Festuca scabrella	-	2	3	10	3	5	5 (5)	5	4 (1)
Koeleria cristata	-	7	7 (2)	8	5	8	3	5	6 (1)
Purshia tridentata	-	1	2	2	10 (27)	10 (21)	10 (32)	5 (2)	2 (1)
Rosa woodsii	1	1	2	2	3 (1)	3	3	5	-
Calamagrostis rubescens	1	-	-	2	-	-	10 (35)	-	10 (39)
Rosa acicularis	-	-	-	-	-	-	3	-	2
Vaccinium caespitosum	-	-	-	-	-	-	8 (1)	-	-
Holodiscus discolor	-	-	-	-	-	-	3 (1)	-	-
Rosa gymnocarpa	-	-	-	-	-	-	-	3	-
Bromus vulgaris	-	-	-	-	-	-	-	-	-

Code to Constancy Values: + = 0-5 %
1 = 5-15%
2 =15-25%
3 =25-35%
4 =35-45%
5 =45-55%
6 =55-65%
7 =65-75%
8 =75-85%
9 =85-95%
10 =95-100%
(Canopy Coverage expressed to nearest %)

Where no coverage value is entered, the average coverage was less than 1 %

Table 3, cont

Constancy and (Average Coverage %) of Important Understory Plants in Western Montana Forest Habitat Types and Phases (5-8-72)

	DOUGLAS -FIR CLIMAX SERIES													SPRUCE CLIMAX
	DF/Ag.sp. h t.	DF/Ca.ru. h t.		DF/Ar.uv. h.t.	DF/Va ca h.t.	DF/Syal (+Caru) h.t.		DF/Ph.ma. h t.		DF/Li bo. h t.		DF/Xe.te. h t		S/Li bo h t
No of Stands:	N=5	Ca.ru. phase N=20	Ag.sp. phase N=6	N=12	N=15	Sy.al. phase N=25	Ag.sp. phase N=9	Ph ma. phase N=29	Ar,uv. phase N=7	Ca.ru phase N=4	3y al phase N=5	Xe.te. phase N=25	Ar uv phase N=13	N=19
Agropyron spicatum	10 (31)	4	10 (7)	5	-	5 (2)	7 (8)	2 (1)	4	-	-	-	1	-
Festuca idahoensis	10 (17)	2	7 (4)	3 (2)	-	2	7 (3)	+	1	-	-	-	1	-
Carex geyeri	4 (6)	8 (8)	8 (20)	6 (5)	5 (3)	8 (7)	6 (8)	7 (5)	9 (5)	5	6 (4)	5 (4)	7 (4)	1
Balsamorhiza sagitata	10 (4)	2	8 (4)	2	1	4	6 (4)	1	1	-	-	+	+	-
Physocarpus malvaceus	-	2	3	2	1	1	1	9 (44)	10 (16)	5 (5)	4 (1)	4 (6)	3	-
Spirea betulifolia	2	9 (3)	5 (4)	7 (7)	9 (13)	8 (15)	6 (7)	8 (5)	9 (5)	10 (2)	10 (17)	10 (4)	9 (9)	8 (9)
Symphoricarpos albus	2	5	8 (2)	7 (2)	6 (4)	9 (30)	10 (13)	9 (15)	9 (7)	5 (2)	10 (34)	2 (1)	4	10 (9)
Arctostaphylos uva-ursi	-	3	3 (3)	10 (31)	9 (34)	4	-	3	9 (14)	8 (2)	6 (8)	+	10 (27)	5 (2)
Festuca scabrella	8 (14)	1	3 (3)	2 (1)	2	1	2	-	-	-	-	-	-	-
Koeleria cristata	6 (8)	-	3	3	-	3	6 (6)	1	-	-	-	-	-	-
Purshia tridentata	-	-	2 (3)	1	-	1	2	1	-	-	-	-	-	-
Rosa woodsii	6 (3)	-	2	2	2	2 (1)	4 (8)	1	1	-	-	-	1	-
Calamagrostis rubescens	4	10 (43)	10 (17)	10 (40)	10 (39)	9 (20)	2	8 (13)	10 (26)	10 (32)	6 (13)	10 (27)	10 (28)	7 (15)
Rosa acicularis	-	-	-	-	2 (2)	2	-	+	-	-	2	-	1	7
Vaccinium caespitosum	-	-	-	-	10 (19)	-	-	-	-	-	-	-	-	5 (4)
Holodiscus discolor	-	-	2	1	1 (2)	1	-	3 (5)	-	-	-	-	-	-
Rosa gymnocarpa	-	2	-	2	5 (3)	4 (4)		6 (4)	6 (1)	5 (2)	4 (4)	6 (4)	5 (2)	4 (4)
Bromus vulgaris	2	-	-	-	1	1	-	1	-	5	6	1	1	3
Pyrola secunda	-	2	-	-	1	-		1	-	8	4	3	1	4
Chimaphila umbellata	-	2	-	-	4	1	-	2	3	8 (2)	4	8	8 (3)	6
Xerophyllum tenax	-	1	-	2	3 (5)	1	-	1	-	3	2	8 (12)	8 (10)	2 (2)
Linnaea borealis	-	1	-	2 (3)	5 (7)	+	-	2	3 (1)	10 (32)	8 (21)	1 (1)	3 (6)	9 (13)
Vaccinium membranaceum	-	1	-	-	1 (2)	-	-	1	1	8 (1)	4 (1)	8 (27)	9 (30)	1
Ribes lacustre	-	1	-	-	-	+	-	1	1	3	-	-	-	1
Shepherdia canadensis	-	1	-	3	3	2	-	1	3	3	6	1	5	4
Alnus sinuata	-	1	-	-	-	-	-	-	-	5 (2)	-	+	-	-
Rubus parviflorus	-	1	-	1	-	-	-	2	-	5	4	3	-	6
Vaccinium scoparium	-	1	-	3 (4)	1	-	-	-	-	5 (16)	-	1 (3)	2	2
Melica subulata	-	-	-	-	+	1	-	1	-	-	2	+	-	4
Trillium ovatum	-	-	-	-	1	-	-	-	-	3	2	1	2	4
Galium triflorum	-	-	-	-	1	-	-	1	-	3	4	+	-	6
Clintonia uniflora	-	-	-	-	1	-	-	-	-	-	2	+	-	6 (2)
Viola orbiculata	-	-	-	-	1	1	-	-	-	5	-	1	1	4
Pyrola asarifolia	-	-	-	-	-	-	-	+	-	5	-	+	2	2
Cornus canadensis	-	-	-	-	-	-	-	-	-	3	-	+	-	7
Actaea rubra	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Aralia nudicaulis	-	-	-	-	-	-	-	-	-	-	2 (7)	-	-	5 (8)
Coptis occidentalis	-	-	-	-	-	-	-	+	-	-	-	2	-	-
Menziesia ferruginea	-	-	-	-	-	-	-	-	-	3	-	+	1	2
Oryzopsis asperifolia	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Athyrium filix-femina	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tiarella unifoliata	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Taxus brevifolia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Streptopus amplexifolius	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gymnocarpium dryopterus	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Veratrum viride	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oplopanax horridum	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luzula glabrata	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ledum glandulosum	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phyllodoce empetriformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Juncus parryi	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Abies lasiocarpa (shrub)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3, cont.

Constancy and (Average Coverage %) of Important Understory Plants in Western Montana Habitat Types and Phases (5-8-72)

	GRAND FIR CLIMAX SERIES			W. HEMLOCK &/or REDCEDAR CLIMAX SERIES							ALPINE FIR (+W.H. CLIMAX SERIES					
	GF/Clintonia h.t.		GF/Xe.te. h. t	WRC/Clintonia h. t.			WH/Clintonia h. t.			WH/Op.ho. h. t.	AF/Clintonia uniflora h t.					AF/Op.ho.
No. of Stands:	Cl. un. phase N-13	Xe. te. phase N-4	N-3	Cl. un. phase N-15	Oy. dr. phase N-6	Me. fe. phase N-8	Cl. un. phase N-16	Oy. dr. phase N-15	Xe. te. phase N-6	N-10	Va. ca. phase N-12	Xe te. phase N-36	Ar mu phase N-13	Cl. un. phase N-22	Me. fe phase N-22	N-6
Agropyron spicatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Festuca idahoensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carex geyeri	2	3	-	-	-	-	1	1 (1)	-	-	1	3	-	4	-	-
Balsamorhiza sagittata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Physocarpus malvaceus	2	-	-	1	-	-	-	-	-	-	-	-	-	1 (1)	-	-
Spirea betulifolia	6 (3)	10 (2)	3	5 (2)	-	4 (1)	6 (4)	3 (1)	7 (1)	-	10 (13)	6 (4)	10 (7)	7 (2)	5 (1)	3
Symphoricarpos albus	8 (7)	3 (4)	-	3 (4)	5	-	2	3	2	4	6 (1)	1 (1)	5 (4)	6 (2)	1	7 (3)
Arctostaphylos uva-ursi	1	3	7	-	-	-	2	1	3 (4)	-	10 (9)	+	-	2	1	-
Festuca scabrella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Koeleria cristata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purshia tridentata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rosa woodsii	-	-	-	-	-	-	1	-	-	-	1	+	-	-	1	-
Calamagrostis rubescens	5 (5)	5 (9)	7 (6)	3	-	1	1	-	-	-	8 (6)	3 (1)	2	5 (5)	1	-
Rosa acicularis	-	-	-	1	2	1	-	-	-	-	2	1	2	2	-	-
Vaccinium caespitosum	-	-	-	-	-	-	1	-	-	-	9 (23)	-	1	2	-	-
Holodiscus discolor	4 (2)	3	-	-	-	-	1	-	-	-	-	-	1	-	-	-
Rosa gymnocarpa	10 (3)	10 (5)	10	6 (2)	3	4 (1)	7 (3)	5	3	1	8 (4)	6 (1)	8 (6)	5 (2)	3	-
Bromus vulgaris	7	5	-	4	-	5	2	2	2	5	2	5	4	6	6	7
Pyrola secunda	8	3	7	7 (1)	8	9 (2)	9 (1)	9	10 (1)	3	4	9	7	9 (2)	8 (1)	5
Chimaphila umbellata	5	10	10	8 (2)	5 (1)	9 (3)	9 (5)	8	10 (10)	-	10 (3)	9 (1)	8	7 (2)	7 (1)	-
Xerophyllum tenax	2	10 (24)	10 (11)	3 (1)	-	10 (3)	4	3	10 (25)	-	7 (25)	8 (17)	4 (1)	5 (3)	8 (6)	2
Linnaea borealis	9 (5)	8 (1)	7 (1)	9 (5)	5 (6)	6 (5)	9 (14)	8 (6)	10 (24)	2	10 (32)	4 (3)	10 (19)	8 (17)	6 (11)	3 (3)
Vaccinium membranaceum	4	10 (20)	10 (3)	6 (5)	5 (3)	9 (11)	8 (8)	9	10 (29)	6	8 (18)	10 (23)	9 (16)	8 (6)	10 (16)	7 (1)
Ribes lacustre	2	-	-	3	5 (1)	5 (1)	1	1 (1)	-	7	-	3	-	7	6	7
Shepherdia canadensis	1	3	-	2	-	1	1	-	3	-	8 (2)	2	2	1	+	-
Linus sinuata	-	-	3	1	-	2 (5)	+	1	-	-	1	5	1	1	4	-
Rubus parviflorus	8	3	3	7 (1)	7 (3)	6 (1)	4	5	2	7	7 (2)	6	10 (11)	9 (5)	8 (2)	8
Vaccinium scoparium	-	3	7	3	-	-	4 (5)	1	5	2	3 (1)	4 (2)	2	+	2	3
Melica subulata	1	-	-	1	3	-	2	3	3	4	2	1	6	-	-	3
Trillium ovatum	3	3	-	3	7 (1)	5	4	3	-	6	3	2	7	6	5	5
Galium triflorum	8	3	-	5	8 (2)	-	3	6 (1)	2	10	2	4	8	6	6	8
Clintonia uniflora	9 (3)	10 (5)	-	9 (4)	8 (9)	9 (3)	10 (13)	9 (6)	10 (5)	10 (11)	10 (5)	9 (4)	9 (7)	8 (5)	7 (7)	8 (5)
Viola orbiculata	6	8	10	7 (1)	10 (2)	7 (1)	9	7 (1)	10 (1)	8	8 (2)	9	8 (1)	7 (1)	8	8
Pyrola asarifolia	2	3	10	5 (1)	7	7 (1)	6	7	8	2	2	5	6	5	5	3
Cornus canadensis	2	-	-	3	2	1	4	2	2	1	6 (2)	1	10 (5)	2 (1)	1	2
Actaea rubra	-	-	-	3	7	-	1	3	-	8	-	1	-	4	2	8
Aralia nudicaulis	5 (7)	-	-	1 (5)	3 (1)	1	5 (1)	5 (2)	2	6 (2)	2	-	10 (18)	-	+	5 (4)
Coptis occidentalis	2	3	-	2 (1)	3 (9)	2	2 (2)	-	2 (3)	1	-	1	1 (1)	2 (5)	3	-
Hensiesia ferruginea	-	3	-	1	2	10 (9)	3	1	5 (1)	5	3	6 (2)	8	4	10 (26)	5 (3)
Hyrysopsis asperifolia	2	-	-	1	-	-	-	1	-	-	3	-	5	+	-	-
Athyrium filix-femina	1	-	-	-	8 (3)	-	+	3	-	10	-	+	-	3	-	10
Clarella unifoliata	4	-	-	3	10 (4)	2	6 (1)	9 (5)	7	10	3	4	8 (3)	5 (2)	5	10
Taxus brevifolia	2	-	-	3 (1)	7 (3)	10 (21)	4 (1)	5 (13)	-	5 (2)	1	2 (1)	5 (1)	3 (2)	2 (5)	10 (20)
Streptopus amplexifolius	-	-	-	1	3	-	1	-	-	5	-	-	2	5	2	5
Thelypteris dryopteris	1	-	-	-	10 (1)	-	1	6 (3)	-	10	-	+	-	1 (3)	1	8
Veratrum viride	-	-	-	-	-	-	-	-	-	6	-	1	1	2	2	8
Elymus glaucus	1	-	-	-	3	-	1	2	-	10 (26)	-	-	-	-	-	8 (50)
Osmorhiza glabrata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adenocaulon bicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Hydrophyllodoce empetriformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Pinus parryi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ribes lasiocarpa (shrub)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3, cont.

Constancy and (Average Coverage %) of Important Understory Plants in Western Montana Habitat Types and Phases. (5-8-72)

	ALPINE FIR (+ MOUNTAIN HEMLOCK) CLIMAX SERIES Continued								TIMBERLINE CLIMAX SERIES	
	AF/Vasc h.t.	AF/Xe.te. h.t.		MH/Xete h.t.	AF/Mefe h.t.	MH/Mefe h.t.	AF/Luzula gl.h.t.		WBP-AF h.t.	AL-AF h.t.
		Caru phase	Xete phase				Vasc phase	Mefe phase		
No. of Stands:	N-9	N-11	N-31	N-5	N-36	N-8	N-22	N-21	N-8	N-30
Agropyron spicatum	-	-	-	-	-	-	-	-	-	-
Festuca idahoensis	-	1		-	-	-	-	-	-	-
Carex geyeri	3	4	5 (1)	-	1	-	8 (2)	2	8 (3)	1
Balsamorhiza sagittata	-	-	-	-	-	-	-	-	-	-
Physocarpus malvaceus	-	-	-	-	-	-	-	-	-	-
Spirea betulifolia	7 (1)	8 (3)	4 (1)	-	-	-	+	-	-	-
Symphoricarpos albus	-	1	-	-	-	-	-	-	-	-
Arctostaphylos uva-ursi	1	5 (3)	+	-	-	-	-	-	-	-
Festuca scabrella	-	-	-	-	-	-	-	-	-	-
Koeleria cristata	-	-	-	-	-	-	-	-	-	-
Purshia tridentata	-	-	-	-	-	-	-	-	-	-
Rosa woodsii	-	-	-	-	-	-	-	-	-	-
Calamagrostis rubescens	6 (2)	8 (2)	4	2	1	-	+	-	-	-
Rosa acicularis	-	1	-	-	-	-	-	-	-	-
Vaccinium caespitosum	-	1 (5)	-	-	-	-	-	-	-	-
Holodiscus discolor	-	-	-	-	-	-	-	-	-	-
Rosa gymnocarpa	-	5 (1)	1	-	-	-	-	-	-	-
Bromus vulgaris	1	-	1	-	+	-	-	-	-	-
Pyrola secunda	7 (1)	5 (1)	8 (1)	6	9 (1)	8	1	3	-	-
Chimaphila umbellata	8 (1)	8 (1)	9 (2)	6	6	3	+	-	-	-
Xerophyllum tenax	6 (7)	10 (43)	10 (41)	10 (52)	10 (19)	10 (37)	10 (28)	6 (7)	9 (19)	4
Linaea borealis	3 (2)	4 (2)	1	-	-	-	-	-	-	-
Vaccinium membranaceum	4 (1)	10 (32)	10 (31)	10 (25)	9 (16)	9 (18)	5 (8)	7 (9)	4	1
Ribes lacustre	-	-	1	-	3 (1)	-	-	1	-	-
Shepherdia canadensis	-	2	-	-	-	-	-	-	-	-
Alnus sinuata	2	2 (1)	3	-	3	-	-	-	-	-
Rubus parviflorus	+	4	3 (1)	-	1	-	-	-	-	-
Vaccinium scoparium	10 (62)	7 (14)	7 (17)	8 (21)	8 (13)	9 (9)	10 (37)	9 (16)	10 (32)	8 (7)
Melica subulata	-	-	-	-	-	-	-	-	-	-
Trillium ovatum	-	-	+	-	1	-	+	+	-	-
Galium triflorum	-	-	-	-	1	-	-	-	-	-
Clintonia uniflora	+	-	+	-	-	-	-	-	-	-
Viola orbiculata	4	6 (1)	6 (1)	-	4	1	4	2	-	-
Pyrola asarifolia	-	2	2	4	6	4	-	-	-	-
Cornus canadensis	-	-	-	-	-	-	-	-	-	-
Actaea rubra	-	-	-	-	+	-	-	-	-	-
Aralia nudicaulis	-	-	-	-	-	-	-	-	-	-
Coptis occidentalis	-	1	1	-	-	-	-	-	-	-
Menziesia ferruginea	2	3	4 (1)	8 (2)	10 (45)	10 (32)	1	9 (38)	-	-
Oryzopsis asperifolia	-	-	-	-	-	-	-	-	-	-
Athyrium filix-femina	-	-	-	-	+	-	-	-	-	-
Tiarella unifoliata	-	-	1	-	2	-	1	1	-	-
Taxus brevifolia	-	1	-	-	-	-	-	-	-	-
Streptopus amplexifolius	-	-	-	-	+	-	+	1	-	-
Gymnocarpium dryopterus	-	-	-	-	+	-	-	-	-	-
Veratrum viride	-	-	-	-	1	-	1	3	-	1
Oplopanax horridum	-	-	-	-	-	-	-	-	-	-
Luzula glabrata	-	-	-	-	+	-	10 (7)	9 (7)	9 (20)	9 (12)
Ledum glandulosum	-	-	-	-	1	-	1 (1)	1	-	3 (2)
Phyllodoce empetriformis	-	-	1	-	1	-	1 (2)	1	1	6 (11)
Juncus parryi	-	-	-	-	-	-	+	1		4 (2)
Abies lasiocarpa (shrub)	-	-	-	-	-	-	-	1	1	5 (8)

Presence List for Western Montana Forest Communities, p. 1 (W. Montana Habitat-type Study, May 10, 1972)

Stands are grouped by habitat type and phase. Only native species present in 5 or more of the 655 stands are listed.

CODE NUMBER	Series:	PP and PP-DF Climax Series									DOUGLAS-FIR Climax Series														SPRUCE
	Habitat-Type:	Sesce	Agsp	Feid		Petr			Syal	Caru	Agsp	Caru		Aruv	Vaca	Syal		Phma		Libo		Xete		Libo
	Phase:			Feid	Fesc	Agsp	Feid	Aruv				Agsp	Caru			Agsp	Syal	Aruv	Phma	Caru	Syal	Aruv	Xete	
TREES	Number of Stands:	8	12	14	6	4	4	4	4	5	5	6	20	12	15	9	25	7	29	4	5	13	25	19
001	Abies grandis (GF)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	5	1	1	2	5	2
002	Abies lasiocarpa (AF)	.	.	.	.	.	.	.	.	.	.	.	4	2	4	.	1	.	.	1	.	4	9	8
003	Betula papyrifera (PB)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	3
004	Juniperus scopulorum (RMJ)	1	.	3	.	2	.	.	.	1	.	2	.	1	.	2	.	1	1	.	.	.	.	.
005	Larix lyallii (AL)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
006	Larix occidentalis (WL)	.	.	.	.	.	.	.	.	.	.	.	3	4	14	.	5	2	7	3	3	8	16	13
007	Picea engelmannii (ES)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	6
008	Picea glauca (WS)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	14
009	Pinus albicaulis (WBP)	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	1	.	.	.	.	.	3	.
010	Pinus contorta (LP)	.	.	.	.	.	.	.	1	1	.	.	7	6	13	.	3	2	5	3	.	6	22	14
011	Pinus monticola (WP)	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	2	3
012	Pinus ponderosa (PP)	7	12	14	6	4	4	4	4	5	3	6	14	11	13	8	22	1	21	2	2	13	14	6
013	Populus tremuloides (QA)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1
014	Populus trichocarpa (BC)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
015	Pseudotsuga menziesii (DF)	8	7	6	1	2	1	3	2	4	5	6	20	12	14	9	25	7	29	4	5	13	25	18
016	Thuja plicata (WRC)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
017	Tsuga heterophylla (WH)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
018	Tsuga mertensiana (MH)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	SHRUBS																							
101	Abies lasiocarpa shrub	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
102	Acer glabrum	4	.	.	.	.	.	.	.	.	.	.	2	1	.	2	6	2	16	1	2	1	11	5
103	Alnus incana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
104	Alnus sinuata	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	2	.	.	1	.
105	Amelanchier alnifolia	7	9	11	5	3	3	4	2	2	3	5	8	8	14	9	22	5	26	2	5	11	15	18
106	Cassiope mertensiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
107	Ceanothus velutinus	2	.	1	.	.	.	.	.	.	.	.	2	1	2	1	4	.	3	.	.	1	2	.
108	Chrysothamnus nauseosus	1	1	1	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
109	Cornus stolonifera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	7
110	Crataegus douglasii	.	.	.	.	.	.	.	.	1	.	.	.	.	1	2	.	.	.	.	.	.	.	.
111	Holodiscus discolor	.	.	.	.	.	.	1	.	.	.	1	.	1	1	.	3	.	8	.	.	.	.	.
112	Juniperus communis	1	1	.	.	.	1	1	.	1	.	.	1	1	2	1	2	.	2	1	.	1	.	.
113	Ledum glandulosm	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
114	Lonicera involucrata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
115	Lonicera utahensis	.	.	.	.	.	.	.	.	.	.	.	3	1	1	.	.	.	7	2	1	3	11	3
116	Menziesia ferruginea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	1	3
117	Oplopanax horridum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
118	Pachistima myrsinites	.	.	.	.	.	.	.	.	.	.	.	3	1	2	.	1	.	4	1	1	1	12	3
119	Philadelphus lewisii	3	1	2	.	.	.	.	1	.	2	1	.	.	.	1	.	2	2	.	.	.	.	.
120	Phyllodoce empetriformis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
121	Phyllodoce glanduliflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
122	Physocarpus malvaceus	2	1	1	1	.	.	.	.	1	.	2	3	2	1	1	2	7	26	2	2	4	8	.
123	Prunus emarginata	1	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.
124	Prunus virginiana	3	4	4	4	2	2	1	4	.	3	1	.	2	.	2	8	1	7	.	.	.	1	3
125	Purshia tridentata	.	1	3	1	4	4	4	2	1	.	1	.	1	1	2	3	.	2	.	.	.	.	.
126	Rhamnus alnifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
127	Rhododendron albiflorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
128	Ribes cereum	3	2	5	1	.	.	.	.	.	2	2	.	2	.	1	1	.	1	.	.	.	.	.
129	Ribes irriguum	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	2	.	.	.	.	.	.	.
130	Ribes lacustre	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	4	1	.	.	.	2
131	Ribes viscosissimum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	4	.
132	Rosa acicularis	.	.	.	.	.	.	1	.	1	.	.	.	.	3	.	5	.	1	.	1	1	.	14
133	Rosa gymnocarpa	.	.	.	.	.	.	.	1	.	.	.	3	2	8	.	11	13	19	2	2	7	16	7
134	Rosa woodsii	1	1	3	1	1	1	1	2	.	3	2	.	2	3	4	5	1	4	.	2	1	2	.
135	Rubus idaeus	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
136	Rubus parviflorus	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	6	2	2	.	8	11
137	Salix scouleriana (mostly)	.	.	.	.	.	.	1	.	.	.	.	1	4	2	1	2	4	6	.	.	5	2	4
138	Sambucus racemosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
139	Shepherdia canadensis	1	2	.	.	1	.	3	.	.	.	.	1	4	5	.	4	.	4	1	3	7	2	7
140	Sorbus scopulina	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	1	2	.
141	Sorbus sitchensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
142	Spiraea betulifolia	4	2	3	.	.	1	4	2	2	1	3	17	8	13	5	19	6	22	4	5	12	23	15
143	Symphoricarpos albus	3	5	6	2	2	1	3	4	1	1	5	9	8	9	9	22	6	26	2	5	6	5	19
144	Taxus brevifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
145	Vaccinium caespitosum	.	.	.	.	.	.	3	.	.	.	.	.	.	15	.	.	.	.	.	.	.	.	9
146	V. membranaceum (globulare)	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	2	3	2	12	21	1
147	Vaccinium myrtillus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1
148	Vaccinium scoparium	.	.	.	.	.	.	.	.	.	.	.	1	3	2	.	.	.	.	2	.	3	3	3
	SUBSHRUBS (including vines)																							
201	Arctostaphylos uva-ursi	3	.	.	.	2	.	4	.	2	.	2	5	12	14	.	9	6	8	3	3	13	1	9
202	Artemisia frigida	.	3	2	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
203	Berberis repens	1	.	1	.	.	.	1	2	2	2	2	12	5	13	4	20	.	23	3	5	12	17	18

Presence List for Western Montana Forest Communities, p.1-a

	GRAND FIR Series			WRC Series			WH Series				AF (+WH) Climax Series																
	Xete	Clin.uni.		Clin.uni.			Clin.uni.			Opho	Opho	Clintonia uniflora					Vasc	Xete		WH/ Xete	AF/ Mefe	WH/ Mefe	AF/ Lugl		Timberline Series WBP-AF	AL-AF	TOTAL
		Xete	Clun	Clun	Gydr	Mefe	Xete	Clun	Gydr			Vaca	Xete	Arnu	Clun	Mefe		Caru	Xete				Vasc	Mefe			
No. Stands	3	4	13	15	6	8	6	16	15	10	6	12	36	13	22	22	9	11	31	5	36	8	22	21	8	30	643
Abie gran	3	4	13	8	4	3	1	7	2	2	1	3	9	2	7	6	1	3	5	1	1	.	.	.	.	.	103
Abie lasi	1	3	3	10	3	8	4	7	2	7	6	12	35	12	22	22	9	11	31	5	36	8	21	19	8	25	363
Betu papy	.	1	4	3	2	1	3	6	9	3	1	1	.	7	.	.	.	.	.	.	.	.	.	.	.	.	45
Juni scop	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14
Lari lyal	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	10	.	30	42
Lari occi	3	3	9	14	2	8	5	14	8	1	5	9	28	12	15	14	4	7	16	2	17	5	.	.	.	.	279
Pice enge	2	2	4	11	4	7	2	6	1	3	4	5	33	7	21	18	6	7	21	4	34	7	15	18	4	11	265
Pice glau	.	.	4	1	.	.	4	4	5	5	2	7	.	6	.	.	.	.	.	.	.	.	.	.	.	.	53
Pinu albi	.	.	.	.	.	.	.	.	.	.	.	1	3	.	1	1	3	2	13	3	15	4	22	15	8	27	124
Pinu cont	2	3	3	5	.	5	2	8	.	.	.	11	18	5	11	10	9	9	28	5	28	6	16	6	.	.	273
Pinu mont	.	4	3	4	2	3	6	14	7	1	3	7	10	8	4	1	4	3	8	3	2	3	.	.	.	.	107
Pinu pond	.	1	4	3	.	.	.	1	.	.	.	3	.	.	10	.	.	4	.	.	.	.	.	.	.	.	222
Popu trem	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Popu tric	.	.	2	2	3	.	.	.	1	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	12
Pseu menz	3	4	13	14	5	8	5	9	9	4	5	11	31	11	18	17	5	10	24	1	21	2	3	.	1	.	460
Thuj plic	.	1	3	15	6	8	6	14	12	8	1	1	3	.	2	3	.	.	.	.	2	.	.	.	.	.	86
Tsug hete	.	1	2	2	1	1	6	16	15	10	2	1	5	3	1	1	.	.	.	.	1	.	.	.	.	.	69
Tsug mert	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	2	1	5	5	4	8	3	1	.	1	33
SHRUBS																											
Abie lasi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	16	19
Acer glab	.	3	12	10	4	3	1	6	14	7	6	3	14	10	11	9	.	3	2	.	.	.	.	.	.	.	171
Alnu inca	.	.	1	.	.	.	.	.	.	.	3	.	1	1	6	.	.	.	.	.	.	.	.	.	.	.	15
Alnu sinu	1	.	.	1	.	2	.	1	1	.	.	1	19	2	3	9	2	2	8	.	11	.	.	.	.	.	67
Amel alni	2	4	10	8	2	3	2	7	12	2	1	10	21	9	15	8	2	5	8	.	2	.	1	.	.	.	331
Casa mert	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	5
Cean velu	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	1	.	.	.	.	.	.	.	22
Chry naus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Corn stol	.	.	4	2	2	.	.	2	4	5	4	1	.	7	7	.	.	.	.	.	.	.	.	.	.	.	47
Crat doug	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Holo disc	.	1	5	.	.	.	.	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	24
Juni comm	.	.	1	.	.	.	1	1	.	.	.	8	2	.	2	.	2	2	.	.	1	.	1	.	1	3	47
Ledu glan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	3	.	2	2	.	9	17
Loni invo	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	.	.	.	.	.	1	.	.	.	.	.	8
Loni utah	.	2	5	9	1	5	4	11	8	1	3	7	28	10	13	18	2	3	12	.	8	3	4	.	.	.	189
Menz ferr	.	1	.	1	1	8	3	5	2	5	3	4	20	5	9	22	2	3	11	4	36	8	2	19	.	.	180
Oplo horr	.	.	1	.	2	.	.	1	3	10	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22
Pach myrs	1	3	3	7	2	6	6	15	6	2	3	8	28	10	10	12	2	5	11	.	4	.	2	.	.	.	183
Phil lewi	.	.	6	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	22
Phyl empe	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	2	.	4	.	3	3	1	19	33
Phyl glan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	5	6
Phys malv	.	.	2	1	.	.	.	.	.	.	.	.	.	.	3	1	.	.	.	.	.	.	.	.	.	.	73
Prun emar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Prun virg	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	52
Purs trid	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30
Rham alni	.	.	1	1	.	.	.	.	.	.	.	.	.	2	4	.	.	.	.	.	1	.	.	.	.	.	11
Rhod albi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	.	.	6
Ribe cere	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20
Ribe irri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Ribe lacu	.	.	3	5	3	4	.	1	2	7	4	.	12	3	16	14	.	.	4	.	9	.	.	2	.	.	98
Ribe visc	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	1	.	.	1	.	.	.	.	11
Rosa acic	.	.	.	1	1	1	.	.	.	.	.	2	5	3	4	.	.	.	.	.	.	.	.	.	.	.	44
Rosa gymn	3	4	13	9	2	3	2	11	7	1	.	10	20	10	13	6	.	5	4	.	.	.	.	.	.	.	204
Rosa wood	.	.	.	.	.	.	.	1	.	.	.	1	1	.	.	2	.	.	.	.	.	.	.	.	.	.	45
Rubu idae	.	.	1	.	1	.	.	1	2	5	3	.	.	.	4	.	.	.	.	.	1	.	.	.	.	1	23
Rubu parv	1	1	11	11	4	5	1	7	7	7	5	8	23	13	21	17	1	4	4	.	4	.	.	.	.	.	186
Sali scou	.	.	1	.	.	1	.	1	.	.	.	2	.	1	1	3	.	4	4	1	2	.	.	.	.	.	53
Samb race	.	.	.	1	.	.	.	.	1	3	2	.	1	.	3	3	.	.	.	.	3	.	.	.	.	.	18
Shep cana	.	1	1	3	.	1	2	2	.	.	.	9	6	2	3	1	.	2	.	.	.	.	.	.	.	.	73
Sorb scop	.	.	4	1	.	2	1	3	2	3	.	1	11	2	8	4	2	2	8	.	2	1	2	.	1	.	65
Sorb sitc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	3	.	.	5
Spir betu	1	4	8	8	.	3	4	10	5	.	2	12	23	13	16	11	6	9	13	.	.	.	1	.	.	.	320
Symp albu	.	1	11	5	3	.	1	4	4	4	4	7	3	7	13	2	.	2	.	.	.	.	.	.	.	.	234
Taxu brev	.	.	3	5	4	8	1	6	7	5	6	1	8	7	6	5	.	1	.	.	.	.	.	.	.	.	75
Vacc caes	.	.	.	.	.	.	.	1	.	.	.	11	.	1	4	.	.	1	.	.	.	.	.	.	.	.	45
Vacc memb	3	4	5	9	3	7	6	12	13	6	4	10	36	12	18	21	4	11	31	5	31	7	11	14	3	4	335
Vacc myrt	.	.	.	.	.	.	.	1	.	.	.	2	2	1	.	.	1	.	.	.	.	.	2	2	1	.	15
Vacc scop	2	1	.	4	.	.	3	7	1	2	2	3	13	2	1	4	9	8	22	4	30	7	21	19	8	23	213
SUBSHRUBS (including vines)																											
Arct uva	2	1	1	.	.	.	2	3	1	.	.	12	1	2	4	2	1	5	1	.	.	.	.	.	.	.	134
Arte frig	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Berb repe	2	3	10	11	.	1	2	8	4	.	.	12	16	8	12	5	1	8	1	.	.	.	.	.	.	.	251

CODE NUMBER	Series	PP and PP-DF Climax Series									DOUGLAS-FIR Climax Series														SPRUCE
	Habitat-Type	Scree	Agsp	Feid		Putr			Syal	Caru	Agsp	Caru		Aruv	Vaca	Syal		Phma		Libo		Xete		Libo
	Phase			Feid	Fesc	Agsp	Feid	Aruv				Agsp	Caru			Agsp	Syal	Aruv	Phma	Caru	Syal	Aruv	Xete	
	Number of Stands	8	12	14	6	4	4	4	4	5	5	6	20	12	15	9	25	7	29	4	5	13	25	19
	SUBSHRUBS (including vines)																							
204	Clematis columbiana-vine	.	.	.	.	.	.	.	.	.	.	.	3	1	2	.	3	2	11	1	1	2	4	5
205	Gaultheria humifusa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
206	Linnaea borealis	.	.	.	.	.	.	.	.	.	.	.	1	2	7	.	1	2	6	4	4	5	3	18
207	Lonicera ciliosa-vine	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	5	.	.	.	.	5
208	Luetkea pectinata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	FERNS & FERN ALLIES																							
251	Athyrium filix-femina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
252	Botrychium virginicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
253	Cystopterus fragilis	.	1	2	.	.	.	.	.	3	.	.	.	.	1	.	2	8	.	.	.	.	.	.
254	Equisetum arvense (mostly)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	5
255	Gymnocarpium dryopteris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
256	Lycopodium annotinum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
257	Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
258	Polystichum munitum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
259	Pteridium aquilinum	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	2	3	2
	GRAMINOIDS																							
301	Agropyron spicatum	6	12	13	6	4	3	1	3	4	5	6	7	6	.	6	12	3	6	.	.	1	.	.
302	Agrostis spp.	.	.	1	1	.	.	.	.	.	.	.	.	.	1	2	.	.	.	.	.	.	.	.
303	Bromus carinatus	.	.	1	1	.	.	.	.	1	.	.	.	1	.	2	2	.	2	.	.	.	1	1
304	Bromus vulgaris	.	.	.	.	.	.	.	.	.	1	.	.	.	2	.	3	.	2	2	3	1	2	5
305	Calamagrostis canadensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
306	Calamagrostis purpurescens	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	2	.	.	.	.	.	.	.
307	Calamagrostis rubescens	1	.	.	1	.	.	4	.	5	2	6	19	12	15	2	23	7	23	4	3	13	24	14
308	Carex concinnoides	2	.	.	.	.	.	1	.	.	.	2	6	8	13	1	12	3	11	4	1	9	14	5
309	Carex geyeri	6	4	2	1	.	.	1	1	2	2	5	15	7	7	5	19	6	19	2	3	9	13	2
310	Carex nigricans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
311	Carex rossii	4	2	3	1	.	.	.	1	1	1	3	1	.	.	1	4	.	4	.	.	2	1	1
312	Carex tolmiei	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
313	Cinna latifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
314	Deschampsia atropurpurea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
315	Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
316	Elymus glaucus	.	.	.	.	.	.	.	.	1	1	.	.	.	3	1	6	.	6	.	1	.	1	11
317	Festuca idahoensis	4	9	14	6	3	4	1	3	5	5	4	3	4	.	6	6	1	1	.	.	1	.	.
318	Festuca occidentalis	.	.	.	.	.	.	.	.	1	.	.	6	2	5	.	6	1	14	2	1	6	6	3
319	Festuca scabrella	.	2	4	6	1	2	2	2	2	4	2	1	2	3	2	3	.	.	.	.	.	.	.
320	Festuca viridula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
321	Juncus drummondii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
322	Juncus parryi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
323	Koeleria cristata	.	8	10	5	2	3	1	2	3	3	2	.	3	.	5	8	.	2	.	.	.	.	.
324	Luzula campestris	.	.	.	.	.	.	.	.	1	.	.	4	2	4	1	2	4	1	.	2	5	2	2
325	Luzula glabrata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
326	L. parviflora var. parviflora	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
327	L. parviflora var. fastigiata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
328	Melica subulata	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1	.	3	.	1	.	1	8
329	Orysopsis asperifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
330	Poa juncifolia	1	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	1	.	.	.	.	.
331	Poa nervosa	.	.	.	.	.	.	.	1	.	.	1	2	.	.	.	1	1	4	.	.	.	.	.
332	Poa sandbergii	4	7	8	3	3	2	1	1	.	1	2	1	1	.	1	5	.	1	.	.	.	.	.
333	Trisetum canescens	.	.	.	.	.	.	.	1	.	.	.	.	1	1	.	3	.	3	.	.	.	1	.
334	Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	FORBS																							
401	Achillea millefolium	7	12	14	6	3	4	3	4	5	5	6	12	11	13	9	17	4	6	.	3	4	3	6
402	Actaea rubra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	4
403	Adenocaulin bicolor	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1	.	3	.	1	.	3	2
404	Allium cernuum	1	3	5	.	1	1	.	.	4	4	4	9	3	5	2	11	3	11	.	1	3	.	3
405	Anaphalis margaritacea	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	1
406	Anemone patens	.	.	.	3	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1
407	Anemone piperi	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	1	.	2	1	.	2	5	1
408	Angelica arguta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
409	Antennaria anaphaloides	.	1	.	1	.	.	.	.	2	3	.	2	.	.	.	2	.	.	.	.	.	.	.
410	Antennaria lanata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
411	Antennaria luzuloides	1	2	2	2	.	1	1	1	.	.	.	.	.	.	1	1	.	1	.	.	.	.	.
412	Antennaria neglecta	1	3	1	.	1	1	1	2	1	.	2	2	2	7	1	6	4	2	.	1	1	.	.
413	Antennaria racemosa	.	1	.	.	.	.	.	.	2	2	2	13	7	9	2	10	4	15	4	2	9	12	4
414	A. rosea & umbrinella	3	4	12	6	3	1	2	2	3	3	3	3	5	1	6	5	1	4	.	1	2	1	1
415	Apocynum androsaemifolium	6	2	4	1	.	2	3	1	2	1	3	2	1	7	5	8	3	4	.	.	6	.	3
416	Aquilegia flavescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
417	Arabis holboellii-b	5	4	5	.	3	.	.	.	.	2	.	4	.	.	2	.	.	.	.	.	.	.	.
418	Aralia nudicaulis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1	.	.	9
419	Arenaria congesta	.	1	1	.	.	2	.	.	1	2	2	.	1	1	.	.	.	.	.	.	.	.	.
420	Arenaria macrophylla	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	4	2	4	.	.	.	4	1
421	Arnica cordifolia	.	.	.	1	.	1	4	.	1	3	4	17	5	10	5	16	6	23	3	3	10	15	5

	GRAND FIR Series			WRC Series			WH Series				AF (+ME) Climax Series														Timberline Series		
	Xete	Clin.uni.		Clin.uni.			Clin.uni.			Opho	Opho	Clintonia uniflora					Vasc	Xete		ME/ Xete	AF/ Mefe	ME/ Mefe	AF/ Lugl		WBP-AF	AL-AF	TOTAL
		Xete	Clun	Clun	Gydr	Mefe	Xete	Clun	Gydr			Vaca	Xete	Arnu	Clun	Mefe		Caru	Xete					Vasc	Mefe		
No. Stands	3	4	13	15	6	8	6	16	15	10	6	12	36	13	22	22	9	11	31	5	36	8	22	21	8	30	643
SUBSHRUBS (including vines)																											
Clem colu	1	1	6	3	2	.	.	1	1	.	.	.	.	2	6	2	.	1	.	.	.	.	.	.	.	.	56
Gaul humi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	1	.	2	5
Linn bore	2	3	12	13	3	5	6	14	12	2	2	12	14	13	18	12	3	4	3	.	.	.	.	.	.	.	188
Loni cili	.	2	8	1	.	.	.	1	.	.	.	3	.	1	3	.	.	.	.	.	.	.	.	.	.	.	27
Luet pect	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	6
FERNS & FERN ALLIES																											
Athy fili	.	.	2	.	5	.	.	1	5	10	6	.	1	2	7	.	.	.	.	.	2	.	.	.	.	.	41
Botr virg	.	.	.	.	1	.	.	.	.	2	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	4
Cyst frag	.	.	1	1	.	.	1	.	1	1	.	.	1	1	2	1	.	.	.	.	.	.	.	.	.	.	27
Equi arve	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3	.	.	.	.	.	.	.	.	.	.	1	6
Gymn dryo	.	.	1	1	6	.	.	1	9	10	5	.	1	6	3	3	.	.	.	.	1	.	.	.	.	.	47
Lyco anno	.	.	.	.	.	.	2	.	2	5	2	.	.	5	.	1	.	.	.	.	1	.	.	.	.	.	18
Lyco comp	.	.	.	.	.	.	4	1	.	.	.	3	.	5	1	.	.	.	.	.	.	.	.	.	.	.	14
Poly muni	.	.	.	.	.	.	.	.	1	.	.	.	2	.	.	1	.	.	.	.	1	.	.	.	.	.	6
Pter aqui	.	1	1	2	2	.	1	5	4	1	.	2	2	6	2	2	.	.	.	.	.	.	.	.	.	.	38
GRAMINOIDS																											
Agro spic	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	104
Agrostis	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	2	.	.	.	.	.	9
Brom cari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	13
Brom vulg	.	2	9	6	1	4	1	3	3	5	4	2	19	5	14	14	1	.	4	.	1	.	.	.	.	.	114
Cala cana	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	1	.	1	.	.	3	7
Cala purp	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	4
Cala rube	2	2	6	4	.	1	.	2	.	.	.	9	11	3	12	3	5	9	11	1	3	.	1	.	.	.	263
Care conc	2	2	4	4	.	2	2	2	1	.	.	4	9	3	9	2	6	10	12	.	6	1	3	.	.	.	176
Care geye	.	1	2	2	.	.	.	1	1	.	.	1	9	.	9	.	3	4	14	.	2	.	18	5	6	2	211
Care nigr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	9
Care ross	.	.	1	.	.	.	.	1	.	.	.	.	5	.	.	1	.	.	4	.	2	.	11	3	5	15	78
Care tolm	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	12	14
Cinn lati	.	.	.	.	.	.	.	.	.	3	1	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	8
Desc atro	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	4	.	5	10
Desc cesp	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	4	6
Elym glau	.	.	1	.	.	.	.	.	.	.	1	.	3	2	3	2	.	.	.	.	1	.	1	1	.	.	46
Fest idah	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	81
Fest occi	1	1	4	4	.	.	1	1	1	.	.	5	6	4	12	4	2	.	4	.	1	.	.	.	.	.	104
Fest scab	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	38
Fest viri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	3	5
Junc drum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	6	7
Junc parr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	1	12	16
Koel cris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	57
Luzu camp	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	32
Luzu glab	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	22	19	7	28	77
Luzu parv	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2	1	.	1	.	.	3	.	.	.	.	.	10
Luzu fast	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	5
Meli subu	.	.	1	1	2	.	2	4	4	4	2	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	40
Oryz aspe	.	.	3	2	.	.	1	2	1	.	.	3	.	6	1	.	.	.	.	.	.	.	.	.	.	.	30
Poa junc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Poa nerv	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	12
Poa sand	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	41
Tris cane	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	1	.	.	.	13
Tris spic	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	3	5
FORBS																											
Achi mill	.	.	.	.	.	.	.	1	.	.	.	3	.	.	2	.	.	1	.	.	.	.	.	.	.	1	165
Acta rubr	.	.	.	5	4	.	.	1	5	8	5	.	2	.	9	4	.	.	.	.	1	.	.	.	.	.	49
Aden bico	.	3	10	6	5	2	1	3	9	8	3	1	8	10	5	3	.	1	.	.	.	.	.	.	.	.	90
Alli cern	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	75
Anap marg	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	6
Anem pate	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Anem pipe	.	1	2	3	2	2	.	.	.	1	.	1	.	1	3	4	.	.	1	.	.	.	.	.	.	.	36
Ange argu	.	.	1	.	1	.	.	.	.	.	.	.	.	1	3	.	.	.	.	.	.	.	.	.	.	1	11
Ante anap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Ante lana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15	15
Ante luzu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Ante negl	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40
Ante race	1	.	2	1	.	.	.	1	.	.	.	5	.	.	3	.	2	7	4	.	1	.	2	.	.	.	127
Ante rose	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	74
Apoc andr	.	.	.	1	.	.	.	.	.	.	.	4	.	1	.	.	.	.	.	.	.	.	.	.	.	.	70
Aqui flav	.	.	1	.	1	.	.	.	1	.	.	.	.	.	1	2	.	.	.	.	.	.	.	.	.	.	6
Arab holb	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25
Aral nudi	.	.	6	2	2	1	1	8	8	6	3	2	.	13	.	1	.	.	.	.	.	.	.	.	.	.	65
Arem cong	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	2	.	1	2	17
Arem macr	.	.	1	.	.	.	.	.	.	.	.	.	.	.	5	2	.	3	2	.	2	.	.	.	1	.	34
Armi cord	1	.	3	.	.	1	.	.	.	.	.	3	4	.	2	.	.	2	1	.	.	.	.	.	.	.	149

CODE NUMBER	Series:	PP and PP-DF Climax Series							DOUGLAS-FIR Climax Series														SPRUCE
	Habitat-Type:	Scree	Agsp	Feid		Putr			Syal	Caru	Agsp	Caru		Aruv	Vaca	Syal		Phma		Libo		Xete		Libo
	Phase:			Feid	Fesc	Agsp	Feid	Aruv				Agsp	Caru			Agsp	Syal	Aruv	Phma	Caru	Syal	Aruv	Xete	
	Number of Stands:	8	12	14	6	4	4	4	4	5	5	6	20	12	15	9	25	7	29	4	5	13	25	19
FORBS continued																								
422	Arnica latifolia	.	.	.	.	.	.	.	.	.	.	.	4	1	1	.	1	.	.	3	.	3	6	5
423	Arnica sororia	.	.	.	1	.	1	.	.	1	1	.	1	.	.	1	.	.	.	.	.	.	.	.
424	Artemisia dracunculus	1	2	1	.	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
425	Artemisia ludoviciana	2	.	1	1	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.
426	Aster conspicuus	.	.	.	.	.	.	1	.	.	.	.	9	2	6	.	8	4	14	2	3	5	10	11
427	Aster foliaceus	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	2	.	.	1	.	1	.	.
428	Aster laevis	1	3	3	1	.	.	2	1	1	1	2	1	.	9	1	5	2	5	.	.	.	.	9
429	Astragalus canadensis	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	1	1	.
430	Astragalus miser	.	2	.	.	.	.	.	.	.	.	.	3	1	.	.	.	.	2	1	1	2	1	.
431	Balsamorhiza sagittata	6	11	13	6	2	4	1	3	4	5	5	3	2	1	5	9	1	4	.	.	.	1	.
432	Brodiaea douglasii	1	1	3	2	.	.	.	1	1	1	2	1	1	.	3	6	1	1	.	.	.	.	.
433	Calochortus apiculatus	.	.	1	.	.	.	2	.	1	2	1	.	2	6	.	5	.	3	.	1	.	2	4
434	Calochortus elegans	.	.	.	.	.	.	1	1	.	.	.	.	.	1	2	5	2	4	.	.	5	4	.
435	Calypso bulbosa	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	3	1	1	1	3	.
436	Campanula rotundifolia	.	2	2	2	.	1	1	.	4	1	1	3	2	8	3	7	3	8	1	1	1	2	10
437	Castilleja hispida	.	4	5	1	.	.	.	.	1	1	.	.	.	.	2	6	.	3	.	.	.	.	.
438	Castilleja miniata	.	1	.	.	.	.	.	.	.	.	.	2	1	.	.	3	2	3	.	.	2	.	.
439	Castilleja lutescens	.	.	.	1	.	1	2	.	.	1	.	.	.	3	1	.	.	.	.	.	1	.	.
440	Cerastium arvense	1	1	2	2	.	.	.	.	2	1	1	.	1	.	2	.	.	.	.	.	.	.	.
441	Chimaphila menziesii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	2	.
442	Chimaphila umbellata	.	.	.	.	.	.	1	.	.	.	.	5	.	6	.	3	2	7	3	2	11	19	11
443	Chimophila tweddyi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
444	Chrysopsis villosa	.	7	.	.	3	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
445	Circaea alpina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
446	Clatonia lanceolata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
447	Clintonia uniflora	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	1	.	1	11
448	Comandra umbellata	2	2	2	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.
449	Coptis occidentalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	6	.
450	Corallorhiza maculata	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	1	.	.	.	.	2	1
451	Corallorhiza striata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2
452	Cornus canadensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	13
453	Crepis atrabarba	.	2	2	3	3	.	.	.	1	3	.	.	.	.	1	2	.	.	.	.	.	1	.
454	Disporum hookeri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	1	1
455	Disporum trachycarpum	.	.	.	.	.	.	.	.	.	.	.	1	.	2	.	9	1	19	.	1	1	3	.
456	D. hookeri & trachycarpum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
457	Dodecatheon conjugens&paucifl.	.	2	.	.	.	.	.	1	1	1	2	4	.	1	.	1	2	3	.	.	3	2	.
458	Dodecatheon jeffreyi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
459	Epilobium angustrifolium	1	.	.	1	.	.	1	1	.	1	.	6	6	5	.	7	2	3	1	1	3	4	6
460	Erigeron divergens-b	.	3	2	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
461	Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
462	Erigeron speciosus	2	1	.	1	1	1	.	.	3	2	2	1	1	1	3	3	.	1	.	.	.	.	.
463	Erythronium grandiflorum	.	.	.	.	.	1	.	.	1	1	.	14	2	4	2	9	3	13	3	2	4	16	1
464	Fragaria vesca	2	1	2	1	.	1	.	1	3	2	4	8	4	2	5	16	5	22	3	2	5	7	5
465	Fragaria virginiana	.	3	3	2	.	2	3	2	3	3	2	15	7	15	3	18	3	13	3	3	8	7	11
466	F. vesca & virginiana	.	.	.	.	.	.	.	.	.	.	.	3	1	.	.	.	1	2	.	1	1	3	5
467	Fritillaria pudica	.	.	1	2	.	1	.	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.
468	Gaillardia aristata	.	3	.	1	3	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
469	Galium boreale	.	.	.	.	.	.	.	.	1	.	.	.	1	2	.	3	.	1	.	1	.	.	10
470	Galium triflorum	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	3	1	2	.	1	11
471	Gentiana calycosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
472	Geranium viscosissimum	.	.	.	1	.	.	.	.	1	.	.	.	1	2	1	3	2	1	.	.	1	.	3
473	Geum triflorum	.	1	4	6	.	1	1	.	2	3	1	2	.	.	2	2	1	2	.	.	.	.	.
474	Gilia aggregata-b	.	2	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
475	Goodyera oblongifolia	.	.	.	.	.	.	.	.	.	.	.	6	3	2	.	6	4	15	2	2	8	11	9
476	Habenaria dilitata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
477	H. elegans & unalaskensis	.	.	.	1	.	.	3	.	.	1	.	4	2	2	.	5	1	5	.	.	4	7	.
478	Habenaria orbiculata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
479	Hedysarum occidentalis	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	1	.
480	Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
481	Heuchera cylindrica	3	.	1	2	.	.	1	.	2	2	1	4	4	.	4	3	3	12	.	1	.	4	1
482	Hieracium albert.&cynogl.	.	2	4	5	.	2	3	2	3	3	4	4	4	5	3	11	2	3	.	.	2	3	.
483	Hieracium albiflorum	.	.	2	.	.	.	2	2	.	2	2	9	1	11	2	11	4	11	4	2	7	13	8
484	Hieracium canadense	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	3	.	.	.	.	.	.	1
485	Hieracium gracile	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
486	Hypopitys monotropa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
487	Lathyrus ochroleucus	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	6
488	Ligusticum canbyi?	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
489	Ligusticum tenuifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
490	Listera convallarioides (mostly)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
491	Listera caurina (mostly)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
492	Listera cordata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
493	Lithophragma parviflora	.	.	1	.	.	1	.	1	.	1	.	2	.	.	2	.	1	1	.	.	.	.	.

Presence List for Western Montana Forest Communities, p. 3-a

	GRAND FIR Series			WRC Series			WH Series				AF (+ MH) Climax Series														Timberline Series		TOTAL
	Xete	Clin.uni.		Clin.uni.			Clin. uni			Opho	Opho	Clintonia uniflora					Vasc	Xete		MH/ Xete	AF/ Mefe	MH/ Mefe	AF/ Lugl		WBP-AF	AL-AF	
		Xete	Clun	Clun	Gydr	Mefe	Xete	Clun	Gydr			Vaca	Xete	Arnu	Clun	Mefe		Caru	Xete				Vasc	Mefe			
No. Stands	3	4	13	15	6	8	6	16	15	10	6	12	36	13	22	22	9	11	31	5	36	8	22	21	8	30	643
FORBS																											
Arni lati	1	3	6	6	1	6	1	2	1	.	4	6	31	12	16	21	5	8	15	1	30	4	12	16	7	17	256
Arni sora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Arte drac	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Arte ludo	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Aste cons	.	.	3	2	.	.	.	.	.	.	.	2	5	1	7	.	.	1	.	.	.	.	1	.	.	.	97
Aste foli	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	1	.	9
Aste laev	.	.	.	.	.	.	.	.	.	.	.	2	.	1	2	.	.	.	.	.	.	.	.	.	.	.	52
Astr cana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	5
Astr mise	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	15
Bals sagi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	86
Brod doug	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25
Calo apic	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	1	.	.	.	.	.	.	1	.	34
Calo eleg	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	1	.	.	.	28
Caly bulb	.	.	.	.	.	2	.	.	.	.	.	.	1	.	3	4	.	.	1	.	.	.	.	.	.	.	22
Camp rotu	.	.	.	.	.	.	.	.	.	.	.	7	.	.	3	.	.	.	2	.	1	.	1	.	1	.	78
Cast hisp	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23
Cast mini	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	3	.	1	.	.	4	.	3	3	29
Cast lute	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
Cera arve	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14
Chim mens	2	.	4	.	.	.	.	.	.	.	.	.	4	.	1	.	.	2	3	.	4	1	.	.	.	.	25
Chim umbe	3	4	7	12	3	7	6	14	12	.	.	12	31	10	16	16	7	9	27	3	22	2	1	.	.	.	294
Chio twee	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	9	10
Chry vill	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Circ alpi	.	.	1	.	2	.	.	.	2	7	1	.	.	.	2	1	1	.	.	.	.	.	.	.	.	.	17
Clay lanc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2	6	9
Clin unif	.	4	12	14	5	7	6	16	14	10	5	12	31	12	18	16	1	.	1	.	.	.	.	.	.	.	199
Coma umbe	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Copt occi	.	1	3	3	2	2	1	3	.	1	.	.	2	1	5	6	.	1	2	.	.	.	.	.	.	.	40
Cora macu	2	1	1	.	.	.	2	1	.	.	.	1	1	1	5	.	.	.	1	.	.	.	.	.	.	.	22
Core stri	.	1	.	.	.	.	2	.	2	.	1	2	.	.	2	.	.	.	.	.	.	.	.	.	.	.	13
Corn cana	.	.	3	5	1	1	1	7	3	1	1	7	3	13	4	2	.	.	.	.	.	.	.	.	.	.	66
Crep atra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18
Disp hook	.	2	8	1	.	2	.	5	2	4	.	1	4	4	1	1	.	.	.	.	.	.	.	.	.	.	39
Disp trac	1	1	4	4	1	.	.	.	.	1	.	.	3	1	5	1	.	.	.	.	1	.	.	.	.	.	68
Disporum	.	.	.	2	2	.	2	5	4	4	4	1	.	2	3	1	.	.	.	.	.	.	.	.	.	.	32
Dode conj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	26
Dode jeff	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	1	.	6	9
Epil angu	.	.	.	1	.	.	.	.	2	2	.	3	4	1	5	2	1	3	3	.	1	1	3	2	1	3	99
Erig dive	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.	7
Erig pere	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	5	4	5	8	25
Erig spec	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	1	.	26
Eryt gran	.	.	1	.	.	.	.	.	.	.	.	.	2	.	2.	1	.	1	.	.	1	.	6	4	3	10	106
Frag vesc	.	2	6	4	.	.	.	1	.	.	.	2	2	3	7	2	.	2	.	.	.	.	.	.	.	.	132
Frag virg	.	1	1	3	.	.	1	1	.	.	.	6	3	2	6	.	.	3	2	.	.	.	1	1	1	.	161
Fragaria	.	.	1	1	.	.	.	4	4	1	.	5	2	2	1	2	.	1	.	.	.	.	.	.	.	.	41
Frit pudi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Gail aris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Gali bore	.	.	1	.	.	.	.	.	.	.	.	5	1	.	4	.	.	.	.	.	.	.	.	.	.	.	30
Gali trif	.	1	11	8	5	.	1	5	9	10	5	2	16	10	21	14	.	.	.	.	3	.	.	.	.	.	140
Gent caly	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	3	5
Gera visc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	1	.	.	.	.	.	.	.	.	19
Geum trif	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30
Gili aggr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Good oblo	3	3	9	12	5	7	6	16	7	3	4	8	34	8	19	21	3	9	24	1	28	7	.	4	.	.	309
Habe dili	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	1	.	.	5
Habe eleg	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	37
Habe orbi	.	.	.	1	.	1	2	4	3	.	.	3	.	1	.	.	.	.	.	.	.	.	.	.	.	.	20
Hedy occi	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	3	.	1	.	4	1	1	.	15
Hera lana	.	.	.	.	1	.	.	.	.	2	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	8
Heuc cyli	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	49
Hier albe	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	2	.	.	1	69
Hier albi	3	2	8	7	1	2	2	10	5	3	2	10	19	5	13	7	5	9	18	2	11	3	5	.	.	.	245
Hier cana	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	10
Hier grac	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	9	5	7	18	40
Hypo mono	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	1	2	3	.	1	.	.	10
Lath ochr	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	9
Ligu canb	.	.	.	.	1	.	.	.	.	.	.	.	1	1	1	1	.	.	1	.	1	.	1	4	.	.	12
Ligu tenu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	1	.	4	7
List conv	.	.	.	1	.	.	4	7	6	.	.	2	.	1	2	.	.	.	.	.	.	.	.	.	.	.	24
List caur	.	.	.	.	.	.	.	.	.	.	.	1	4	1	1	5	.	.	2	.	2	1	.	1	.	.	19
List cord	.	.	.	1	.	2	.	1	.	.	1	.	4	2	2	6	.	.	1	.	.	1	.	2	.	.	23
Lith parv	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10

Presence List for Western Montana Forest Communities, P.4

CODE NUMBER	Series:	PP and PP-DF Climax Series									DOUGLAS-FIR Climax Series														SPRUCE
	Habitat-Type:	Scree	Agsp	Feid		Putr			Syal	Caru	Agsp	Caru		Aruv	Vaca	Syal		Phma		Libo		Xete		Lib
	Phase:			Feid	Fesc	Agsp	Feid	Aruv				Agsp	Caru			Agsp	Syal	Aruv	Phma	Caru	Syal	Aruv	Xete	
	Number of Stands:	8	12	14	6	4	4	4	4	5	5	6	20	12	15	9	25	7	29	4	5	13	25	14
	FORBS continued																							
495	Lithospermum ruderale	1	10	9	6	3	4	.	3	4	2	1	2	1	2	6	9	.	2	.	.	.	.	.
496	Lomatium ambiguum	.	2	.	.	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
497	Lomatium dissectum	2	2	1	1	.	1	.	.	.	1	.	.	.	.	2	1	.	1	.	.	.	.	.
498	Lomatium triternatum	.	1	6	2	2	2	1	2	3	4	1	3	2	.	3	4	1	1	.	.	1	.	.
499	Lupinus spp.	3	7	10	5	1	4	2	2	5	4	2	13	7	10	4	11	3	5	.	.	4	5	6
500	Microseris nutans	.	1	3	2	1	1	.	1	3	3	1	4	1	1	1	4	1	3	.	.	.	.	.
501	Mitella breweri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
502	Mitella stauropetala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	6	.	1	1	6	1
503	Monarda fistulosa	.	1	.	2	.	.	.	.	1	.	.	.	.	.	1	2	.	1	.	.	.	.	.
504	Monotropa uniflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
505	Osmorhiza chilensis	.	.	.	.	.	.	.	1	.	.	.	6	1	4	1	7	1	11	2	5	.	11	16
506	Osmorhiza occidentalis	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	2	.	1	.	.	.	.	.
507	Pedicularis bracteosa	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	3	1
508	Pedicularis contorta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	3	.
509	Pedicularis racemosa	.	.	.	.	.	.	1	.	.	.	.	3	.	5	.	1	.	.	.	.	2	5	2
510	Penstemon albertinus	7	4	5	3	1	.	.	2	1	1	3	3	4	.	5	4	3	6	.	.	8	.	.
511	Penstemon confertus	.	.	.	2	.	1	2	.	2	.	.	4	2	5	.	2	2	3	.	.	.	.	1
512	Penstemon ellipticus	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
513	Penstemon procerus	.	.	.	.	.	.	1	.	.	.	.	.	1	.	2	2	1	1	.	.	1	.	1
514	Penstemon wilcoxii	4	4	5	1	.	1	.	.	.	2	1	5	1	.	2	8	1	5	.	.	2	2	.
515	Perideridia gairdneri	.	.	.	.	.	.	.	.	.	.	.	1	.	2	1	2	1	.	.	1	.	.	.
516	Phacelia hastata & hetero.	4	.	1	1	.	1	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.
517	Phlox pulvinata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
518	Polemonium pulcherrimum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
520	Potentilla arguta	1	.	.	3	1	.	2	.	1	.	.	1	.	.	1	1	.	2	.	.	.	.	.
521	Potentilla flabellifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
522	Potentilla glandulosa	.	.	1	.	1	.	.	1	.	1	1	1	2	.	2	1	2	.	.	.	.	.	.
523	Prenanthes sagittata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
524	Prunella vulgaris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1
525	Pterospora andromedia	.	.	.	.	.	.	1	.	1	.	.	.	.	4	1	.	1	1	.	.	2	.	.
526	Pyrola asarifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	.	2	1	2
527	Pyrola dentata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	1	1	.
528	Pyrola picta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	1
529	Pyrola secunda	.	.	.	.	.	.	.	.	.	.	.	3	.	2	.	.	.	2	3	2	1	4	3
530	Pyrola uniflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
531	Pyrola virens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	1	2
532	Ranunculus uncinatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1
533	Sanicula marilandica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
534	Saxifraga bronchialis var. austromontana.																							
535	Sedum stenopetalum	2	1	2	.	.	1	1	.	3	3	3	5	3	.	5	9	1	6	.	.	1	1	.
536	Senecio canus	2	4	2	.	2	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
537	Senecio integerrimus	.	.	1	1	.	.	.	.	1	2	.	1	.	.	1	1	1	.	.	.	1	1	.
538	Senecio pseudaureus	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	1
539	Senecio triangularis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
540	Silene douglasii	.	.	.	2	.	.	.	.	.	1	.	2	1	.	.	2	.	.	.	.	.	.	.
541	Silene menziesii	.	1	.	.	1	.	.	1	.	.	.	1	2	1	.	2	1	5	.	1	3	2	2
542	Smilacina racemosa	1	1	.	1	.	.	.	.	.	1	.	12	1	4	3	9	4	18	1	3	3	9	5
543	Smilacina stellata	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	4	.	7	2	2	.	6	14
544	Solidago missouriensis	1	1	3	1	.	1	.	1	2	1	1	.	3	.	.	1	.	1	.	.	.	.	.
545	Stenanthium occidentale	.	.	.	.	.	.	.	.	1	.	.	3	1	1	.	.	.	2	.	.	.	.	.
546	Streptopus amplexifolius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
547	Thalictrum occidentale	.	.	.	.	.	.	.	.	.	.	.	11	1	3	.	9	2	15	1	4	2	15	13
548	Tiarella unifoliata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
549	Trillium ovatum	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	1	2	3	7
550	Urtica dioica	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	1
551	Valeriana dioica & occidentalis	.	.	.	.	.	.	.	.	.	.	.	5	1	1	1	4	2	4	1	2	1	1	2
552	Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
553	Veratrum viride	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
554	Vicia americana	.	.	.	.	.	.	.	.	1	.	.	.	1	2	.	.	1	.	.	1	.	.	5
555	Viola adunca	.	.	.	.	.	.	.	.	.	.	.	.	2	7	.	6	3	10	.	1	2	.	5
556	Viola canadensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
557	Viola glabella	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
558	Viola orbiculata	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	2	.	1	2	8
559	Xerophyllum tenax	1	.	.	.	.	.	.	.	.	.	.	2	2	4	.	2	2	2	1	1	11	20	9
560	Zigadenus venenosus	.	1	2	2	1	2	1	1	2	2	.	.	2	1	3	3	1	1	.	.	.	.	.
	ANNUALS																							
901	Clarkia pulchella	.	2	2	2	.	.	.	.	.	4	4	7	3	2	5	12	.	10	.	.	1	2	.
902	Collinsia parviflora	3	7	10	4	.	2	1	3	3	.	.	.	.	.	.	.	1	.	.	.	.	.	.
903	Collomia linearis	3	11	5	4	2	3	.	2	1	3	3	1	1	.	5	5	1	3	.	.	.	.	.
904	Epilobium paniculatum	4	8	7	1	.	2	1	3	4	1	1	2	2	1	3	6	.	1	1	.	1	.	.
905	Galium aparine	.	1	.	1	.	2	.	.	.	.	.	.	.	.	3	.	.	2	.	.	.	.	.
906	Melampyrum lineare	.	.	1	.	.	.	1	.	.	.	.	.	.	8	.	.	1	2	1	.	1	.	2
907	Microsteris gracilis	2	.	1	.	.	.	.	.	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.
908	Montia perfoliata ?	.	.	1	.	.	.	.	.	1	1	.	.	.	.	1	.	.	2	.	.	.	.	.
909	Montia sibirica ?	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
910	Phacelia linearis	.	5	1	1	1	2	.	.	2	.	1	.	.	.	.	.	.	.	.	.	.	.	.
911	Polygonum douglasii & majus	3	4	3	2	.	.	.	.	1	1	.	.	.	.	1	.	1	.	.	.	.	.	.

Presence List for Western Montana Forest Communities, p. 4-a

	GRAND FIR Series			WRC Series			WH Series				AF (+WH) Climax Series									MH/ Xete	AF/ Mefe	MH/ Mefe	AF/ Lugl		Timberline Series		
	Xete	Clin.uni.		Clin.uni.			Clin.uni.			Opho	Opho	Clintonia uniflora					Vasc	Xete							ABF-AF	AL-AF	TOTAL
		Xete	Clun	Clun	Gydr	Mefe	Xete	Clun	Gydr			Vaca	Xete	Arnu	Clun	Mefe		Caru	Xete					Vasc	Mefe		
No. Stands	3	4	13	15	6	8	6	16	15	10	6	12	36	13	22	22	9	11	31	5	36	8	22	21	8	30	643
FORBS																											
Lith rude	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	65
Loma ambi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Loma diss	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12
Loma trit	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	3	43
Lupinus	.	.	1	1	.	.	.	1	.	.	.	3	1	.	2	1	1	3	4	.	1	1	2	.	3	.	138
Micr nuta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	31
Mite brew	.	.	.	1	1	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	1	.	2	5	.	2	14
Mite stau	.	.	4	3	1	1	.	.	1	.	.	.	6	1	7	6	.	1	4	.	7	.	.	.	.	.	60
Mona fist	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Mono unif	.	1	2	.	1	.	.	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	7
Osmo chil	2	3	11	5	5	2	2	6	9	10	5	9	17	11	21	16	.	3	4	.	6	.	1	.	.	.	214
Osmo occi	.	.	.	1	.	.	.	.	.	.	.	.	.	.	2	.	1	.	.	.	.	.	.	.	.	.	8
Pedi brac	1	.	1	.	.	1	.	1	.	.	.	2	1	.	.	.	1	4	2	.	2	1	5	5	2	1	36
Pedi cont	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	2	2	.	1	.	7	.	1	9	28
Pedi race	.	1	1	.	.	3	1	.	.	.	.	4	7	2	8	8	1	1	13	.	9	.	1	3	3	.	85
Pens albe	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2	.	.	.	57
Pens conf	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	.	27
Pens elli	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	3	7
Pens proc	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	11
Pens wilc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	44
Peri gair	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Phac hast	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	10
Phlo pulv	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	6
Pole pulc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	1	.	.	.	.	.	.	3	7
Pote argu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Pote flab	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	3	5
Pote glan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Pren sagi	.	.	1	1	.	.	.	.	.	.	.	.	.	1	3	.	.	.	.	.	.	.	.	.	.	.	6
Prun vulg	.	.	1	1	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	6
Pter andr	.	.	.	.	.	.	.	.	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	14
Pyro asar	3	1	2	7	4	6	5	10	9	2	2	2	19	8	12	11	.	.	7	2	20	3	3	.	.	.	147
Pyro dent	1	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	8
Pyro pict	1	2	.	.	.	.	.	.	.	.	.	.	4	.	1	.	.	1	2	2	1	2	.	.	.	.	19
Pyro secu	2	1	9	11	5	7	6	14	13	3	3	5	31	9	20	18	6	6	24	3	31	6	3	6	.	.	271
Pyro unif	.	.	.	1	.	.	.	2	4	.	1	.	1	.	2	1	.	.	.	.	2	.	.	.	.	.	14
Pyro vire	2	.	4	5	2	3	4	10	7	1	.	1	4	4	1	3	1	1	5	.	4	.	.	.	.	.	72
Ranu unci	.	.	.	.	.	.	.	.	1	2	.	.	.	1	3	3	.	.	.	.	.	.	.	.	.	.	12
Sani mari	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	6
Saxi bron	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	3	.	3	7
Sedu sten	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	47
Sene cana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Sene inte	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1	.	14
Sene pseu	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	6
Sene tria	.	.	1	1	3	.	.	.	.	1	1	.	.	.	11	5	.	.	1	.	4	.	2	6	.	5	43
Sile doug	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	9
Sile menz	.	.	1	.	.	.	.	1	.	.	.	.	2	.	5	1	.	.	.	.	.	.	.	.	.	.	33
Smil race	.	1	5	7	5	1	1	3	2	3	1	5	6	5	4	3	1	1	.	.	.	.	.	.	.	.	130
Smil stel	1	2	12	8	4	2	3	12	11	9	6	7	10	10	15	8	.	.	.	.	1	.	.	1	.	.	159
Soli miss	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	19
Sten occi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	9
Stre ampl	.	.	.	1	2	.	.	2	.	5	3	.	.	2	11	4	.	.	.	.	2	.	.	2	.	.	36
Thal occi	1	3	4	5	2	3	.	.	2	7	6	3	28	11	19	16	3	10	.	.	8	.	2	1	.	.	210
Tiar unif	.	.	5	5	6	2	4	9	14	10	6	3	15	11	10	11	.	.	4	.	6	.	1	3	.	.	127
Tril ovat	.	1	3	5	4	4	.	6	4	6	3	4	7	9	13	11	.	.	1	.	4	.	.	1	.	.	101
Urti dioi	.	.	1	.	2	.	.	.	.	3	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Vale dioi	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	27
Vale sitc	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	3	1	1	4	.	2	.	7	1	2	1	25
Vera viri	.	.	.	1	.	.	.	.	.	6	5	.	2	1	5	4	.	.	.	.	3	.	3	6	.	3	39
Vici amer	.	.	.	1	.	.	.	1	1	.	.	2	.	1	1	.	.	.	.	.	.	.	.	.	.	.	18
Viol adun	.	.	4	2	.	1	.	1	.	.	.	3	.	1	4	1	.	1	1	.	.	.	.	.	.	.	55
Viol cana	.	.	3	.	.	.	.	.	.	.	3	.	.	2	.	1	.	.	.	.	1	.	.	.	.	.	15
Viol glab	.	.	.	.	.	.	.	1	3	5	.	.	.	.	4	5	.	.	1	.	1	1	.	.	.	.	21
Viol orbi	3	3	8	11	6	6	6	15	11	8	5	10	33	10	16	17	4	7	20	.	16	1	8	5	.	.	244
Xero tena	3	4	2	5	.	8	6	7	4	.	1	8	30	5	11	17	5	11	31	5	35	8	22	13	7	11	310
Ziga vene	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25
ANNUALS																											
Clar pulc	.	.	.	.	.	.	.	1	1	.	.	4	.	1	.	.	.	.	.	.	.	.	.	.	.	.	6
Coll parv	.	.	.	.	.	.	.	1	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	91
Coll line	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	53
Epil pani	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	49
Gali apar	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Mela line	.	.	.	.	.	.	.	.	.	.	.	5	1	1	.	.	.	1	.	.	.	.	.	.	.	.	25
Micr grac	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Mont perf?	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Mont sibi?	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	2
Phac lina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Poly doug	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	17

Table 5

Mean Basal Areas and Site Indexes for Western Montana Stands by Habitat Type[1] (5-8-72).

Habitat Type	Basal Area in sq. ft.	Site Index by Species											
		PP	DF	LP	WL	WS	GF	WWP	WRC	WH	AF	ES	MEP
PP &-or DF/ "Scree"	156 ±77	50 ±?	38 ±?										
PP/Agsp (+DF)	99 ±23	53 ±10											
PP/Feid "	142 ±23	51 ±5	48 ±12										
PP/Putr "	113 ±40	46 ±7	50 ±11										
PP/Syal "	159 ±?	55 ±?											
PP/Caru "	165 ±40	51 ±?											
DF/Agsp	134 ±29	-	48 ±11										
DF/Caru	210 ±37	56 ±5	52 ±5										
DF/Aruv	179 ±46	64 ±8	54 ±7	51 ±?									
DF/Vaca	205 ±44	72 ±5	59 ±8	52 ±7	57 ±6								
DF/Syal(+Caru)	159 ±22	61 ±5	54 ±4	-	57 ±?								
DF/Phma	147 ±16	65 ±8	56 ±4	48 ±?	57 ±?								
DF/Libo	202 ±53	-	57 ±15	-	55 ±?								
DF/Xete	179 ±26	54 ±8	55 ±5	44 ±8	55 ±7	-	-	-	-	-	47 ±?	-	-
S/Libo	239 ±53	-	67 ±9	61 ±4	67 ±6	57 ±12	-	-	-	-	-	66 ±11	-
GF/Clun	207 ±46	-	64 ±10	46 ±?	70 ±?	-	59 ±10	-	-	-	-	73 ±?	-
GF/Xete - no data													
WRC/Clun	297 ±106	-	67 ±?	-	68 ±8	-	-	45 ±?	50 ±13	-	60 ±?	68 ±9	-
WH/Clun	293 ±68	-	-	-	69 ±11	-	49 ±?	60 ±?	45 ±?	54 ±?	65 ±?	71 ±17	-
WH/Opho	408 ±132	-	-	-	-	-	-	-	-	-	-	-	-
AF/Opho	331 ±81	-	-	-	-	-	-	-	-	-	-	75 ±?	-
AF/Clun	248 ±21	68 ±?	69 ±5	58 ±4	62 ±4	-	54 ±?	43 ±?	40 ±?	45 ±?	56 ±5	61 ±5	-
AF/Vasc	201 ±44	-	-	47 ±?	54 ±?	-	-	-	-	-	49 ±?	-	-
AF/Xete	176 ±25	-	53 ±4	42 ±3	50 ±6	-	-	32 ±?	-	-	42 ±5	53 ±?	-
MH/Xete	208 ±70	-	-	-	-	-	-	-	-	-	-	-	-
AF/Mefe	175 ±36	-	54 ±8	54 ±10	59 ±9	-	-	-	-	-	47 ±7	58 ±6	-
MH/Mefe	190 ±68	-	-	-	-	-	-	-	-	-	-	-	-
AF/Lugl	188 ±26	-	-	35 ±5	-	-	-	-	-		35 ±5	51 ±9	29 ±6
WBP-AF	147 ±56	-	-	-	-	-	-	-	-	-	18 ±7	-	18 ±7
AL-AF	172 ±28	-	-	-	-	-	-	-	-	-	-	-	-

[1] Confidence limits (95%) for estimating the mean are given for all data where n=5 or more and where data were available for all phases constituting a given type. Question marks are shown where n=3 or 4 or where n=5 or more but not all phases within the type were represented.

More detailed basal area and site index data (by phase) are given with the habitat type write-ups.

Infections by Habitat Types and Phases in Western Montana

Habitat Type-Phase	No. of stands in type N	Douglas-Fir: stands w/DF n	Douglas-Fir: None % of n	Douglas-Fir: Light % of n	Douglas-Fir: Mod % of n	Douglas-Fir: Severe % of n	Western Larch: stands w/WL n	Western Larch: None % of n	Western Larch: Light % of n	Western Larch: Mod % of n	Western Larch: Sever % of n
PP &/or DF/Scree	6	6	66	17	-	17	-	-	-	-	-
PP(DF)Climax Series											
Agsp	12	7	86	14	-	-	-	-	-	-	-
Feid - Feid	14	6	83	17	-	-	-	-	-	-	-
Feid - Fesc	6	1	-	-	-	-	-	-	-	-	-
Putr - Agsp	4	2	-	-	-	-	-	-	-	-	-
Putr - Feid	4	1	-	-	-	-	-	-	-	-	-
Putr - Aruv	4	3	-	-	-	-	-	-	-	-	-
Syal	4	2	-	-	-	-	-	-	-	-	-
Caru	5	4	50	25	-	25	-	-	-	-	-
DF Climax Series											
Agsp	5	5	80	20	-	-	-	-	-	-	-
Caru - Caru	15	15	60	13	13	13	2	-	-	-	-
Caru - Agsp	5	5	60	-	20	20	-	-	-	-	-
Aruv	10	10	60	20	10	10	3	-	-	-	-
Vaca	15	15	80	20	-	-	14	64	14	7	14
Syal - Syal	23	23	52	22	22	4	5	75	-	25	-
Syal - Agsp	8	8	75	12	12	-	-	-	-	-	-
Phma - Phma	25	25	56	24	8	12	7	86	-	14	-
Phma - Aruv	5	5	20	20	60	-	1	-	-	-	-
Libo - Caru	3	3	-	-	-	-	3	-	-	-	-
Libo - Syal	4	4	50	25	-	25	2	-	-	-	-
Xete - Xete	15	15	53	27	7	7	7	100	-	-	-
Xete - Aruv	11	11	45	-	18	36	7	57	-	29	14
Spruce Climax Series											
S/Libo	14	13	100	-	-	-	9	100	-	-	-
GF Climax Series											
Clun - Clun	10	10	80	10	10	-	7	86	-	-	14
Clun - Xete	3	3	-	-	-	-	2	-	-	-	-
Xete	2	2	-	-	-	-	2	-	-	-	-
WH or WRC Climax Series											
WRC/Clun - Clun	8	8	63	12	12	12	8	25	25	25	25
Clun - Gydr	2	1	-	-	-	-	1	-	-	-	-
Clun - Mefe	3	3	-	-	-	-	3	-	-	-	-
WH/Clun - Clun	7	5	100	-	-	-	6	17	17	50	17
Clun - Gydr	2	1	-	-	-	-	1	-	-	-	-
Clun - Xete	2	2	-	-	-	-	2	-	-	-	-
WH/Opho	2	-	-	-	-	-	-	-	-	-	-
AF Climax Series											
Opho	4	3	-	-	-	-	3	-	-	-	-
Clun - Clun	17	15	60	7	27	7	11	27	-	27	45
Clun - Vaca	7	6	100	-	-	-	5	100	-	-	-
Clun - Arnu	5	4	100	-	-	-	4	75	-	25	-
Clun - Xete	17	16	81	19	-	-	13	69	8	23	-
Clun - Mefe	10	8	62	38	-	-	8	62	12	-	25
Vasc	9	5	100	-	-	-	4	100	-	-	-
Xete - Xete	21	17	71	24	6	-	11	82	18	-	-
Xete - Caru	9	8	88	-	-	12	5	100	-	-	-
MH/Xete	1	1	-	-	-	-	1	-	-	-	-
Mefe	20	11	100	-	-	-	9	89	11	-	-
MH/Mefe	2	1	-	-	-	-	1	-	-	-	-
Lugl - Vasc	22	3	-	-	-	-	-	-	-	-	-
Lugl - Mefe	11	-	-	-	-	-	-	-	-	-	-

* _ _ _ _ _ Little or no dwarfmistletoe apparent in this type.

** _____ Dwarfmistletoe infestation common in this type.

Pinus ponderosa or Pseudotsuga menziesii/"Scree" h.t.

1. HABITAT

PP or DF/"Scree" h.t. is restricted to steep slopes (greater than 30°) composed primarily of fine rock. Soils have not developed on these sites, due to continual movement of the rock fragments. The type is generally on dry south-facing midslopes and occurs over a broad elevational range. (Plots taken on this study ranged from 3100'-7150'). It is most prevalent on south slopes along some of the major streams such as the Clark Fork, Bitterroot, and Kootenai Rivers. This h.t. is new and was not described by the Daubenmires (1968).

2. VEGETATIONAL INDICATORS

There are no vegetational indicators to describe this edaphic h.t. The primary characteristic is the steep slopes composed primarily of fine rock. The overstory is scattered Pinus ponderosa and/or Pseudotsuga menziesii. Understory vegetation is poorly developed and quite variable within a given stand as well as between stands.

3. MANAGEMENT IMPLICATIONS

Steepness of slopes, lack of soil development, low basal area, low site indexes, and lack of regeneration are characteristic of this h.t. (The basal areas listed in the table are quite high because all plots were located to include trees.) Any uses made of this h.t. should be restricted to those which occur naturally, such as use by wildlife.

*Pinus ponderosa***/*Agropyron spicatum* h.t.
(PP/bluebunch wheatgrass)

1. HABITAT

PP/Agsp is the driest h.t. within the *Pinus ponderosa* series. The h.t. is generally found on dry south-facing slopes. It is usually the driest habitat in an area or is adjacent to a steppe. Adjacent, more moist h.t.s are usually *PP/Feid* or *PP/Syal*. With the exception of the possible presence of *Pseudotsuga menziesii*, this h.t. is about equal to the *PP/Agsp* h.t. described by the Daubenmires (1968).

N.F. vicinity	No. plots	Elev. range
Kootenai	*	
Flathead	1	4100
West Lolo	5	2700-3400
East Lolo	4	3300-3800
Bitterroot	2	4380-4560

2. VEGETATIONAL INDICATORS

Bunchgrasses and prairie forbs such as *Balsamorhiza* and *Lithospermum* dominate the understory of old-growth stands. *Agropyron spicatum* is the predominant grass. *Festuca idahoensis*, *Festuca scabrella*, *Calamagrostis rubescens*, and *Arctostaphylos uva-ursi* are poorly represented (coverage less than 5%).

3. MANAGEMENT IMPLICATIONS

This h.t. is marginal for tree growth, but is one of the two best h.t.s for livestock forage production. Big-game forage production is low, however, the big game winter demand on this h.t. may be relatively high. On big-game winter ranges that both livestock and big game use, the forage production may need to be allocated to one or the other depending on objectives.

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* Probably present.

** *Pseudotsuga menziesii* is a minor climax in a part of all the h.t.s in the *Pinus ponderosa* series, except in *PP/Caru* where it is a minor climax throughout the h.t. Although DF may be present, it is not reproducing vigorously enough, because of dry conditions, to replace PP even after centuries without fire or other disturbance.

Pinus ponderosa/Festuca idahoensis h.t.
(PP/Idaho fescue)

1. HABITAT

The *PP/Feid* h.t. is slightly more moist than the *PP/Agsp* h.t. It is usually found on relatively dry east to northwest midslopes. Adjacent drier types are often *PP/Agsp* or steppe. Moister habitats are commonly in the *PP/Syal* h.t. The *Festuca idahoensis* phase of the *PP/Feid* h.t. is about equal to the *PP/Feid* h.t. of the Daubenmires (1968). The *Festuca scabrella* phase is new and is the most moist of the PP/bunchgrass types.

N.F. vicinity	No. plots	Elev. range
Kootenai	1	2550
Flathead	2	4900-4920
West Lolo	5	3100-4300
East Lolo	2	4400-4600
Bitterroot	10	3990-5280

2. VEGETATIONAL INDICATORS

Bunchgrasses and prairie forbs dominate the understory. *Calamagrostis rubescens* and *Arctostaphylos uva-ursi* are poorly represented (crown coverage less than 5% of ground surface).

a. *Festuca idahoensis* phase

Festuca idahoensis is well represented (crown coverage more than 5%) and *Festuca scabrella* is poorly represented.

b. *Festuca scabrella* phase

Festuca scabrella is well represented.

3. MANAGEMENT IMPLICATIONS

Management of the *PP/Feid* h.t. is very similar to the *PP/Agsp* h.t. Forage production may be slightly greater due to a slightly more moist environment.

Pinus ponderosa/Purshia tridentata h.t. (PP/bitterbrush)

1. HABITAT

The PP/Putr h.t. is primarily on relatively dry, gravelly benches or rocky south-facing slopes at lower elevations. Adjacent h.t.s may include the PP/bunchgrass h.t.s or the more mesic PP/Syal. This h.t. is about equal to the Daubenmires' (1968) PP/Putr h.t. They also recognized that a variety of grasses are associated with Purshia tridentata. It is most common on the Kootenai N.F., drier parts of the West Lolo, and the southern part of the Bitterroot N.F.

N.F. vicinity	No. plots	Elev. range
Kootenai	6	2500-3300
Flathead	*	
West Lolo	1	2620
East Lolo	-	
Bitterroot	5	3790-5000

* probably present

2. VEGETATIONAL INDICATORS

Purshia tridentata is well represented(covg. is more than 5%) in old-growth stands.

3. PHASES

a. Agropyron spicatum phase

Agropyron spicatum is the dominant grass. Festuca idahoensis, Festuca scabrella, Calamagrostis rubescens, and Arctostaphylos uva-ursi are poorly represented(covg. is less than 5%).

b. Festuca idahoensis phase

Festuca idahoensis is well represented. Calamagrostis rubescens and Arctostaphylos uva-ursi are poorly represented.

c. Arctostaphylos uva-ursi phase

Arctostaphylos uva-ursi and/or Calamagrostis rubescens are well represented.

4. MANAGEMENT IMPLICATIONS

Timber site indexes of this habitat type are similar to the previous h.t.'s. However, PP/Putr-Aruv appears to be somewhat more productive than the other two phases.

50-Year Site Indexes

Phase	PP	DF	Basal Area (sq. ft./A.)
Agsp	46♣?	-	87♣?
Feid	44♣?	-	70♣?
Aruv	49♣?	50♣?	176♣?

The demand for big-game winter forage is often very high in this habitat because of the aspect, elevation, and the presence of *Purshia tridentata*, one of the more desireable big-game browse plants.

Pinus ponderosa/Symphoricarpos albus h.t. (PP/snowberry)

1. HABITAT

The PP/Syal h.t. is one of the most mesic in the *Pinus ponderosa* series. Adjoining drier h.t.s may include any of the previous h.t.s. More moist adjacent habitats are often in the DF series. The PP/Syal h.t. may be found on south-facing midslopes or on benches. The elevational range of the four sample plots taken was from 2600' on the West Lolo to 5150' on the Bitterroot N.F. This habitat is about equal to the PP/Syal h.t. described by the Daubenmires (1968).

2. VEGETATIONAL INDICATORS

Purshia tridentata is absent or poorly represented(covg. less than 5%). *Symphoricarpos albus* and *Spiraea betulifolia* dominate the understory.

3. MANAGEMENT IMPLICATIONS

The PP/Syal h.t. appears to be one of the most productive sites in the *Pinus ponderosa* series. The site index for ponderosa pine in this h.t. is slightly higher than in any other h.t. in the series for which we have data.

Livestock forage production may be variable, depending on the grass composition and coverage.

Winter big-game demand and forage supply is usually somewhat less than in the PP/Putr h.t.

Pinus ponderosa/Calamagrostis rubescens h.t. (PP/pinegrass)

1. HABITAT

The PP/Caru h.t. seems to be rare and is transitional between the Pinus ponderosa series and Pseudotsuga menziesii series. It is possible that a successional stage on the DF/Caru h.t. might be confused with the PP/Caru h.t. The key difference is that DF is incapable of obtaining climax dominance on the latter h.t. and is usually represented in old-growth undisturbed stands as scattered individuals. Tentatively, 10 established DF saplings or trees/A. will be used as the dividing line between the PP/Caru h.t. and DF/Caru h.t. Also, no LP or WL should be present in the PP/Caru h.t.

Adjacent drier h.t.s may include PP/Putr, PP/bunchgrass, or grassland. Adjacent Pseudotsuga menziesii h.t.s may be DF/Caru or DF/Aruv. This h.t. was not described by the Daubenmires (1968).

The PP/Caru h.t. is often on gentle east to west midslopes, benches, or ridges. The elevations of the five reconnaisance plots taken in this h.t. ranged from 2750' on the Kootenai N.F. to 5250' on the Bitterroot N.F.

2. VEGETATIONAL INDICATORS

Grasses and forbs dominate the understory. Calamagrostis rubescens is well represented(covg. is greater than 5%).

3. MANAGEMENT IMPLICATIONS

Timber productivity is somewhat less than in the DF/Caru h.t. The demand for big-game winter forage in the PP/Caru h.t. is probably greater than in the DF/Caru h.t. because of less snow depth. However, neither habitat ranks very high on a relative scale for big-game winter forage.

Pseudotsuga menziesii/Agropyron spicatum h.t. (DF/bluebunch wheatgrass)

1. HABITAT

The DF/Agsp h.t. is restricted to droughty soils on warm, dry, SSE to W exposures on mid slopes to ridges. It is cooler and has a shorter growing season than PP/Agsp. Common appearance is a DF-prairie savanna.

DF/Agsp is found rarely in Western Montana but should become common in the continental climate of Eastern Montana. It occurs on all Western Montana N.F.s from elevations of 2700-5700'. Above this elevation sites with similarly severe environments are often Calamagrostis rubescens & Carex geyeri dominated savannas.

Care needs to be taken in sampling stands containing increasing coverage of Symphoricarpos albus and Calamagrostis rubescens in the shade of forest canopies, indicating seral conditions in non-canopy interspaces and a potential climax of DF/Syal or DF/Caru.

2. VEGETATIONAL INDICATORS

Agropyron spicatum, Festuca idahoensis & scabrella, and other bunchgrasses and prairie forbs (e.g. Balsamorhiza, Lithospermum) form the dominant undergrowth.

Pinus ponderosa may be a minor climax associate within its altitudinal range, the open nature of the forest canopy preventing exclusion by Pseudotsuga menziesii.

3. MANAGEMENT IMPLICATIONS

This is the least productive h.t. in the DF climax series. Basal area in natural stands is only 134±29 sq. ft. and site indexes are approximately 46±?' and 48±11' for PP & DF respectively. It should provide good winter wildlife range, grazing, etc.

Pseudotsuga menziesii/Calamagrostis rubescens h.t. (DF/pinegrass)

1. HABITAT

The DF/Caru h.t. is found on cool and dry, SE to NW exposures on upper and mid slopes at the upper elevational limits of the DF climax series. The characteristic appearance of old-growth stands is large, limby DF with a dense green sward undergrowth. At lower elevations PP is the normal seral dominant.

It is sparsely represented in the mesic regions of Western Montana, becoming common in the drier mountain ranges of the Bitterroot and East Lolo N.F.s.

N.F. vicinity	No. plots	Elev. range
Kootenai	2	2650-4550
Flathead	1	5450
West Lolo	3	2940-3540
East Lolo	12	4100-7200
Bitterroot	6	4340-6900

2. VEGETATIONAL INDICATORS

Calamagrostis rubescens and Carex geyeri are the dominant undergrowth, often with much Arnica spp. Spirea betulifolia and Symphoricarpos albus are often present, but in this type are subordinant. Considerable variation exists in the relative proportions of Calamagrostis and Carex in our stands.

3. PHASES

Two phases are recognizable in this type:

a. Calamagrostis rubescens phase

Bunchgrasses are poorly represented in DF/Caru-Caru; Pinus contorta and Larix occidentalis are often present. It is similar to Daubenmires' DF/Caru h.t., except we generally have more Spirea betulifolia and Symphoricarpos albus in the undergrowth.

N.F. vicinity	No. plots	Elev. range
Kootenai	1	4550
Flathead	1	5450
West Lolo	1	3540
East Lolo	12	4100-7200
Bitterroot	4	5520-6900

Adjacent h.t.s are AF/Mefe on NE slopes, DF/Phma on rocky soils below, and DF/Xete on cool and slightly moister sites.

b. Agropyron spicatum phase

Bunchgrasses (e.g. Agropyron spicatum, Festuca idahoensis and scabrella) are well represented; Pinus contorta and Larix occidentalis are absent. This phase is generally restricted to the lower elevational limits of the DF/Caru h.t. Pinus ponderosa is a major seral component of the overstory.

DF/Caru-Agsp should be scarce in the Kootenai and Flathead N.F.s, increasing in abundance toward the east.

N.F. vicinity	No. plots	Elev. range
Kootenai	1	2650
Flathead	*	
West Lolo	2	2940-3040
East Lolo	1	
Bitterroot	2	4340-5100

*probably present

Adjacent h.t.s are DF/Phma on cool and moist, DF/Aruv on moister, and PP/Feid or Agsp on drier sites.

4. MANAGEMENT IMPLICATIONS

Site index is somewhat better in DF/Caru-Agsp than in DF/Caru-Caru.

	50-Year Site Index			
phase	PP	DF	LP	WL
Caru	56±6	50±5	39±?	49±?
Agsp	57±11	60±?		

In DF/Caru-Caru phase Calamagrostis rubescens and Carex geyeri both maintain themselves by means of extensive rhizome systems in closed stands. The rhizomes expand profusely following fire or logging. Severe competition with tree seedlings results.

In contrast, on the drier DF/Caru-Agsp phase, Calamagrostis rubescens may be less abundant following distubance.

Pseudotsuga menziesii/Arctostaphylos uva-ursi h.t. (DF/kinnikinnick)

1. HABITAT

The DF/Aruv h.t. is variable in its habitat. The archtype occurs on warm, well-drained, fertile benches and gentle slopes in the West Fork of the Bitterroot River and in Kootenai N.F. Other stands occur at higher elevation on steep southerly slopes. Environmentally, the two situations are quite different.

N.F. vicinity	NO. plots	Elev. range
Kootenai	3	2950-4800
Flathead	*	
West Lolo	1	4800
East Lolo	2	
Bitterroot	6	5020-5800

*probably present

Adjacent h.t.s include AF/Clun on mesic sites, DF/Caru on xeric well developed soils, and DF/Phma on moist rocky soils.

2. VEGETATIONAL INDICATORS

Calamagrostis rubescens and Carex geyeri form the dominant understory; Arctostaphylos uva-ursi is present and not scarce.

3. MANAGEMENT IMPLICATIONS

The site index for PP is quite high on this type and is good for DF.

Tree regeneration problems will be similar to DF/Caru.

Pseudotsuga menziesii/Vaccinium caespitosum h.t (DF/dwarf huckleberry)

1. HABITAT

The DF/Vaca h.t. is found on warm, moist, well-drained soils on gentle S to W lower and mid-slopes and benches.

This type is most common in the West Lolo & Kootenai N.F.s and is less common in the Flathead and East Lolo.

N.F. vicinity	No. plots	Elev. range
Kootenai	7	2500-3800
Flathead	1	3600
West Lolo	5	3200-4300
East Lolo	2	4200-4500
Bitterroot	-	-

Adjacent types are S/Libo or AF/Clun-Vaca on more mesic sites and DF/Aruv on warmer or drier sites.

2. VEGETATIONAL INDICATORS

Vaccinium caespitosum is present; Calamagrostis rubescens and Arctostaphylos uva-ursi are well represented. Abies lasiocarpa or Picea spp. may be present as accidentals.

3. MANAGEMENT IMPLICATIONS

DF/Vaca appears to be the most productive h.t. for Ponderosa pine, with a 50-yr. site index of 72±5'. It also appears a good site for DF, LP, & WL.

Regeneration problems will be similar to the DF/Caru h.t

Pseudotsuga menziesii/Symphoricarpos albus h.t. (DF/snowberry)

1. HABITAT

DF/Syal h.t. is found on warm and dry E to W exposures, mostly on midslopes. It occurs mostly at lower elevations but may occur at 6000+' on warm slopes in the Bitterroot N.F.

This h.t. is found rarely in the Kootenai and is common in the Flathead, Lolo, & Bitterroot N.F.s.

N.F. vicinity	No. plots	Elev. range
Kootenai	1	2150
Flathead	8	3400-4300
West Lolo	5	3050-4100
East Lolo	5	3500-4520
Bitterroot	15	3900-6400

Adjacent h.t.s are commonly DF/Agsp on warmer and drier, PP/Syal on drier, DF/Libo on moister, and DF/Phma on cool and moist (usually associated with changes in topography) sites.

2. VEGETATIONAL INDICATORS

Symphoricarpos albus &-or Spirea betulifolia at least co-dominant with Calamagrostis rubescens, Carex geyeri, and-or Arctostaphylos uva-ursi.

3. PHASES

The Western Montana DF/Syal h.t. is broader than Daubenmires' (1968) DF/Syal h.t. There are two phases in Montana:

a. Symphoricarpos albus phase

DF/Syal-Syal is similar to Daubenmires' (1968) DF/Syal h.t. except in the presence of abundant Calamagrostis rubescens, Carex geyeri, &/or Arctostaphylos uva-ursi in addition to the Symphoricarpos albus union. Bunchgrasses are poorly represented in this phase; LP & WL are often present as minor seral species.

b. Agropyron spicatum phase

Bunchgrasses (e.g. Agropyron spicatum, Festuca idahoensis, or Festuca scabrella) are well represented in old-growth, undisturbed stands; LP & WL are absent. This phase is generally restricted to warmer and drier exposures. Stands are often of an open nature with low basal area and sometimes appear similar to the DF-prairie savanna described for the DF/Agsp h.t. This phase represents a transitional environment between DF/Syal & DF/Agsp h.t.s.

4. MANAGEMENT IMPLICATIONS

Site index is good in DF/Syal-Syal for both PP and DF. DF/Syal-Agsp has fair site index but basal areas were low on the open, droughty, sites sampled.

50-Year Site Indexes

Phase	PP	DF	WL
Syal	63±5	54±5	57±?
Agsp	53±?	55±?	-

Pseudotsuga menziesii/Physocarpus malvaceus h.t. (DF/ninebark)

1.HABITAT

The DF/Phma h.t. is found on relatively cool & moist sites of all aspects. Slope position ranges from benches to upper slopes but is mostly mid slope. The type is found from low to mid elevations (2550-5700'). Soils are generally coarse textured and well-drained.

DF/Phma is least well represented in the Flathead & kootenai N.F.s. The h.t. is rarely found in the Glacier Park, Swan River, and Blackfoot River areas.

It is found adjacent to DF/Syal on warmer or drier sites, DF/Xete on drier and cooler exposures at higher elevations, and GF/Clun on more mesic sites.

2. VEGETATIONAL INDICATORS

Physocarpus malvaceus or Holodiscus discolor are well represented.

3. PHASES

a. Physocarpus malvaceus phase

Calamagrostis rubescens, Carex geyeri, and Arctostaphylos uva-ursi are poorly represented or at least subordinant to the shrubs. DF/Phma-Phma is similar to Daubenmires' (1968) DF/Phma h.t.

N.F. vicinity	No. plots	Elev. range
Kootenai	2	2550-2800
Flathead	4	3250-3600
West Lolo	7	2540-5690
East Lolo	10	3600-5500
Bitterroot	6	4100-5250

b. Arctostaphylos uva-ursi phase

DF/Phma-Aruv is the low elevation representative of the DF/Phma h.t. Physocarpus malvaceus or Holodiscus discolor are well represented, but the understory is dominated by Calamagrostis rubescens, Arctostaphylos uva-ursi, &-or Carex geyeri. This phase is found on drier westerly exposures. The general appearance of the stand is a Calamagrostis or Arctostaphylos union with a scattered shrub layer superimposed above. DF/Phma-Aruv represents an environmental overlap of DF/Phma & DF/Aruv h.t.s. It appears to be quite different from DF/Phma-Phma and should be managed separately.

N.F. vicinity	No. plots	Elev. range
West Lolo	2	3440
East Lolo	2	4300
Bitterroot	3	4480-5030

4. MANAGEMENT IMPLICATIONS

Judging from site indexes and basal areas in natural stands, the two phases are good producers of PP & DF. WL & LP are fair within their ranges for DF/Phma-Phma,

	50-Year Site Indexes			
phase	PP	DF	LP	WL
Phma	64±12	56±4	48±?	57±8
Aruv	66±?	53±17		

Pseudotsuga menziesii/Linnaea borealis h.t. (DF/twinflower)

1. HABITAT

The DF/Libo h.t. is found on moist, warm to cool sites on all aspects. Slope position varies from benches to lower mid-slopes and elevation is below 5000'. Soils appear to be moderately well drained.

This h.t. often forms a transition between the DF climax series and those of S, GF, or AF and is quite variable in vegetation and habitat features.

DF/Libo is found in all the National Forests. In the Kootenai typical sites are on benches and gentle slopes while in the Bitterroot it occurs on steeper mid and lower slopes. It may be more common in forests east of Missoula as a geographic replacement for the Clintonia uniflora union.

2. VEGETATIONAL INDICATORS

Linnaea borealis is well represented and-or Clintonia uniflora or Galium triflorum present.

3. PHASES

a. Calamagrostis rubescens phase

DF/Libo-Caru seems to be on relatively cooler NE slopes where Calamagrostis rubescens comes down to lower elevations. Symphoricarpos albus and Spiraea betulifolia are poorly represented and Calamagrostis rubescens well represented.

Adjacent types may be DF/Phma on rocky soils or DF/Caru on drier soils farther up the slope. S/Libo or AF/Clun may be present on more mesic sites.

b. Symphoricarpos albus phase

DF/Libo-Syal is found in warm and moist environments on benches and southerly slopes. Symphoricarpos albus and Spirea betulifolia are well represemted. Moist site forbs such as Smilacina spp., Rubus parviflorus, Trillium ovatum, etc. are well represented.

This phase may be rare on the Bitterroot N.F. Adjacent types may be DF/Syal or DF/Aruv on drier and S/Libo or AF/Clun on moister sites.

4. MANAGEMENT IMPLICATIONS

The number of samples does not allow accurate interpretations of site indexes and basal areas for the phases. High individual stand basal areas of 291 and 252 sq. ft. indicates that both phases may be fairly productive.

50-Year Site Index				
phase	PP	DF	LP	WL
Caru		52±?	58±?	55±?
Syal	47±?	58±?		55±?

Pseudotsuga menziesii/Xerophyllum tenax h.t. (DF/beargrass)

1. HABITAT

The DF/Xete h.t. is found on cool and dry sites. It can be found on middle to upper slopes on all but NE aspects. Sample plot elevations range from 5200-5600' in the Kootenai and Flathead ,3400-5900' in the West Lolo, and 5000-6800' in the Bitterroot and East Lolo N.F.s.

DF/Xete is scarce in the Kootenai and Flathead N.F.s and common in the rest of Western Montana.

Adjacent types are AF/Xete on colder slopes at higher elevation, DF/Caru on cool and dry sites with well-developed soils, and AF/Mefe on cold and moist Ne slopes.

2. VEGETATIONAL INDICATORS

Xerophyllum tenax and-or Vaccinium membranaceum are well represented. Abies grandis and Abies lasiocarpa are present only as non-reproducing accidentals.

3. PHASES

The wide range of elevation associated with the DF/Xete h.t. makes it desirable to divide the type into two phases.

a. Xerophyllum tenax phase

This is the high altitude phase of the DF/Xete h.t. Elevations are over 5000' in DF/Xete-Xete.

N.F. vicinity	No. plots	Elev. range
Kootenai	1	5300
Flathead	2	5200-5600
West Lolo	11	4800-5880
East Lolo	7	5000-6750
Bitterroot	4	5200-6850

b. Arctostaphylos uva-ursi phase

Arctosyaphylos uva-ursi is present. Elevational ranges are lower and the site is warmer. DF/Xete-Aruv was not observed in the Flathead or Kootenai N.F.s.

N.F. vicinity	No. plots	Elev. range
West Lolo	6	3420-5000
East Lolo	3	4250-4295
Bitterroot	4	4920-5730

4. MANAGEMENT IMPLICATIONS

Site indexes indicate both phases to be fair for DF and the Aruv phase is fair for PP. There were not enough samples to make inferences for WL and LP. Basal areas are moderate, but quite variable in natural stands.

	50-Year Site Indexes				
phase	PP	DF	LP	WL	GF
Xete	53±?	57±7	39±?	60±?	
Aruv	54±10	53±7	48±?	51±?	64±?

Picea/Linnaea borealis h.t.
(spruce/twinflower)

1. HABITAT

The S/Libo habitat type covers a limited area on broad valley bottoms and benches in the Flathead and Kootenai N.F.s between Libby and the North Fork Flathead River Valley. Elevations range from about 2700 to 4000 feet. This habitat is usually transitional between DF/Vaca or DF/Libo and AF/Clun-Vaca or AF/Clun-Arnu--the former types being slightly drier, and the latter being moister and often confined to narrower valley bottoms in frost-pocket situations. Occasionally in dry areas of the East Lolo and Bitterroot N.F.s, Picea engelmannii extends down canyons beyond Abies lasiocarpa and A. grandis and a S/Libo h.t. occurs locally.

2. VEGETATIONAL INDICATORS

Picea, or Picea and Pseudotsuga are the indicated climax species. Most of the following species are present or well represented in the understory: Aralia nudicaulis, Clintonia, Cornus canadensis, Galium triflorum, Linnaea, Oryzopsis asperifolia, and Rosa acicularis. Stands within this transitional type show considerable variation in composition. Some are apparently mixed climaxes of Picea glauca and Pseudotsuga with an understory similar to that of DF/Vaca. Others indicate a climax of Picea glauca x P. engelmannii hybrids without Pseudotsuga, and with a Clintonia union understory.

3. MANAGEMENT IMPLICATIONS

Judging from site index data, this habitat type is one of the most productive for DF, LP, and WL. Gentle terrain and easy access are also among its attributes.

Abies grandis/Clintonia uniflora h.t.
(GF/queencup beadlilly)

1. HABITAT

The GF/Clun h.t. is the warmest and driest of the h.t.s having the Clintonia uniflora union. It is found at lower elevations along stream bottoms, on benches, and north slopes. It is also found on mesic slopes of all aspects at higher elevations.

The range of distribution for GF in Montana is approximately eastward to Logan pass, lower Swan Valley on the east slopes of the Mission Mtns., Jocko Lakes, Missoula, and the east slopes of the Bitterroot Mtns. south to the West Fork of the Bitterroot River. There are scattered accidentals beyond this boundary and in many areas within GF is essentially absent. GF/Clun was sampled in all National Forests but not in the East Lolo.

N.F. vicinity	No. of plots	Elev. range
Kootenai	2	3600-4400
Flathead	8	2900-4400
West Lolo	4	2900-4900
Bitterroot	3	3580-4380

Adjacent h.t.s include AF,WRC, or WH/Clun in cooler environments, WH/Opho on wet sites, GF/Xete on cooler and drier uplands, and DF/Phma on drier slopes.

2. VEGETATIONAL INDICATORS

Key indicator species are Clintonia uniflora and Galium triflorum. Alternate indicators include Coptis occidentalis, Cornus canadensis, Trillium ovatum, and Viola orbiculata.

3. PHASES

a. Clintonia uniflora phase

GF/Clun-Clun is similar to Daubenmires' (1968) GF/Pamy h.t. It is the warm and moist representative of our two phases. Clintonia uniflora, Galium triflorum, Tiarella unifoliata, Disporum hookeri, and Coptis occidentalis are often well represented.

b. Xerophyllum tenax phase

GF/Clun-Xete is found in slightly cooler and drier environments. The Clintonia union is weakly represented and Xerophyllum tenax and-or Vaccinium membranaceum are well represented. This phase is a transitional zone between GF/Clun and GF or AF/Xete h.t.s.

4. MANAGEMENT IMPLICATIONS

There were insufficient sample trees for expression of productivity for most species on the GF/Clun h.t. DF has a site index of 70±10 and GF 59±10 on GF/Clun-Clun. GF site index includes data from sites on the periphery of GF distribution and is lower than for GF within the core area of its distribution. Spruce and WL appear to do very well on GF/Clun-Clun, but only a few trees were sampled. Site index data within GF/Clun-Xete are inadequate, but appear low.

	50-Year Site Index						
phase	PP	DF	LP	WL	WS	GF	WP
Clun	60±?	70±10	51±?	79±?	63±?	59±10	44±?
Xete		52±?	37±?	52±?		25±?	44±?

Basal areas are quite high on GF/Clun-Clun. Data are inadequate on the Xete phase.

Abies grandis/Xerophyllum tenax h.t. (GF/beargrass)

1.HABITAT

The GF/Xete h.t. is the coolest and driest h.t. in the GF climax series. It is found on mid to upper slopes at moderate elevations (4700-5300' for three plots).

Only two plots were sampled in the West Lolo and one in the Bitterroot N.F.s. The type may be present in the Kootenai and Flathead N.F.s, but is relatively uncommon in Western Montana.

Adjacent h.t.s are GF/Clun on warm and moist, DF/Xete on drier, and AF/Xete on colder sites.

2. VEGETATIONAL INDICATORS

The understory is dominated by Xerophyllum tenax, Vaccinium membranaceum, Chimaphila umbellata, and Pyrola secunda and asarifolia. (The Clintonia uniflora union is absent)

3. MANAGEMENT IMPLICATIONS

The site index data appears to be quite low and is inconclusive due to the small sample. Basal areas are quite high (223±107 sq. ft. with a range of 215-231 for two plots).

Thuja plicata/Clintonia uniflora h.t. (WRC/queencup beadlilly)

1. HABITAT

The WRC/Clun h.t. is slightly more cool and moist than the GF/Clun h.t. GF is often a major component of the site but does not reproduce as successfully as WRC and can be considered a minor climax or major seral species. WRC/Clun is found on moist benches, stream terraces, lower slopes, and mid-slopes. Elevation ranges are 3000-4700' in the Kootenai and 4100-5300' in the East Lolo N.F.s.

It is common in the more mesic drainages of the Kootenai, Flathead, and West Lolo N.F.s. There are only a few isolated stands in the Bitterroot N.F. south to Rock Creek, west of Darby. The three stands listed for the East Lolo N.F. were in the Jocko River drainage, Flathead Indian Reservation.

Within the range of WH, WRC/Clun occupies relatively warmer and drier uplands. WH/Clun occupies lower slopes and bottoms and fingers up cool and moist ravines with WRC/Clun on adjacent slopes. Eastward, WRC/Clun occupies the bottoms and fingers up the draws with GF/Clun on adjoining slopes. Other adjacent h.t.s may be AF/Clun, AF/Mefe, DF/Phma, and WH/Opho.

2. VEGETATIONAL INDICATORS

Clintonia uniflora and-or Galium triflorum are present. Alternate indicators may be Tiarella unifoliata, Coptis occidentalis, Actaea rubra, Cornus canadensis, Trillium ovatum, and Taxus brevifolia.

3. PHASES

Our WRC/Clun is broader than the Daubenmires' (1968) WRC/Pamy h.t. and contains three phases:

a. Clintonia uniflora phase

WRC/Clun-Clun is similar to portions of the Daubenmires' (1968) WRC/Pamy h.t. It is found on moist, well drained soils, on most aspects on lower slopes to bottoms.

N.F. vicinity	No. plots	Elev. range
Kootenai	3	3000-4350
Flathead	7	3150-4360
West Lolo	4	3280-5200
East Lolo	1	4100

b. Gymnocarpium dryopteris phase

Moist site ferns are present (e.g. Gymnocarpium, Athyrium, Botrychium, etc.) and-or Oplopanax horridum present (Athyrium and Oplopanax are not well represented and Athyrium is less than two feet tall). WRC/Clun-Gydr is found on wet benches and bottoms. It is similar to some of the Daubenmires' (1968) WRC/Pamy h.t.

N.F. vicinity	No. plots	Elev. range
Kootenai	*	
Flathead	2	3200-3900
West Lolo	3	2900-3100
East Lolo	1	5100

*probably present

c. Menziesia ferruginea phase

WRC/Clun-Mefe is the new representative within the WRC/Clun h.t. Menziesia ferruginea is present and not scarce; Oplopanax and moist site ferns are absent. It is found on cool and moist mid and lower slopes on NE aspects. It is a transitional environment from WRC/Clun to AF/Clun-Mefe or AF/Mefe.

N.F. vicinity	NO. plots	Elev. range
Kootenai	1	4700
Flathead	3	
West Lolo	3	4300-5250
East Lolo	1	5300

4. MANAGEMENT IMPLICATIONS

Site indexes appear lower than what would be expected for WRC sites. This is probably a reflection of the difficulty in finding free growing individuals in old growth stands. Most samples may have been partially suppressed. In WRC/Clun-Clun productivity looks good for DF,WL, and ES. Not enough samples were collected to make sound predictions for other species in this phase or for WRC/Clun-Gydr or WRC/Clun-Mefe.

	50-Year Site Index								
phase	PP	DF	LP	WL	GF	WP	WRC	AF	ES
Clun	79±?	64±15	52±?	66±10	61±?	43±?	50±21	29±?	66±17
Gydr				88±?			58±?	70±?	71±?
Mefe		74±?	60±?	64±?		48±?	43±?	55±?	69±?

Basal areas are very high, especially in WRC/Clun-Gydr. In general, WRC/Clun-gydr may be the most productive phase, followed by WRC/Clun-Clun and WRC/Clun-Mefe respectively.

Tsuga heterophylla/Clintonia uniflora h.t.
(WH/queencup beadlily)

1. HABITAT

The WH/Clun h.t. occurs on a variety of moist slopes on all aspects up to about 4000 feet elevation in northwestern Montana. It is especially prevalent in low valleys where annual precipitation averages 30 or more inches. The lowermost portions of the Clark Fork and Kootenai River drainages in Montana (including lower slopes of the Cabinet Range) and the Lake McDonald area in Glacier National Park represent this habitat type. WH also is found sporadically in several areas of the Flathead N.F., often with WRC.

The competitive relationships among WH, WRC, GF, and AF defined for northern Idaho by the Daubenmires (1968), do not appear to be so clear cut near these species' range limits, in western Montana or in Idaho's upper Selway drainage (Habeck 1972). For example, WH usually appears capable of climax dominance in the forests where it occurs; however it is an accidental or even a minor climax species in some stands where AF is the indicated climax dominant.

Generally WH/Clun can be considered to have the most moist and mild climate of Montana's upland forest types. It borders the WH/Opho h.t. on sites having a year-round water table near the surface. Drier slopes often have either WRC/Clun or GF/Clun.

2. VEGETATIONAL INDICATORS

WH is well represented and reproducing successfully; Clintonia and/or Galium triflorum are present, and Oplopanax poorly represented.

3. PHASES

a. Clintonia uniflora phase

Oplopanax and moist ferns are absent; Xerophyllum is poorly represented. This phase, common on moist slopes and benches, is apparently intermediate in moisture to the other two presented.

b. Gymnocarpium dryopteris phase

Moist-site ferns (Gymnocarpium, Athyrium, Botrychium, etc.) and/or Oplopanax are present. This appears to be a "moist phase" of the type and is common especially in ravines.

c. Xerophyllum tenax phase

Xerophyllum is well represented in undisturbed, old-growth stands; Oplopanax and moist ferns absent. This appears to be a drier, upland phase, and is often found on midslopes.

4. MANAGEMENT IMPLICATIONS

This habitat type has a very high potential for vegetation production and a moderate potential for water yield.

Tsuga heterophylla/Oplopanax horridum h.t. (WH/devils club)

1. HABITAT

WH/Opho h.t. is essentially the same as the Daubenmires' (1968) WRC/Opho h.t. for northern Idaho. The name change reflects WH's increased importance in this type in Montana. WRC is often poorly represented here. This type is restricted to wet bottoms and toe-slope seepage areas in northwestern Montana. It is usually confined to such sites below about 4000-4200 feet; higher up, AF/Opho is present.

2. VEGETATIONAL INDICATORS

Oplopanax horridum and *Athyrium filix-femina* well represented.

3. MANAGEMENT IMPLICATIONS

This is a highly productive site for timber species, and the ancient stands found here may be good candidates for natural areas. (Fire has often had little affect in these wet sites.)

Vegetation manipulation in this habitat type requires certain constraints because of the streamside locations. Road construction or site development also present problems relating to high water table, poor drainage, and flooding potential.

Abies lasiocarpa/Clintonia uniflora h.t.
(AF/queencup beadlily)

1. HABITAT

AF/Clun is the mildest (warm and moist) habitat within the subalpine fir climax series, except for the scarce and localized AF/Opho h.t. It is common on moist slopes, benches, and stream bottoms, and in low-elevation frost pockets and constricted canyons.

It covers large areas of the Flathead N. F. from valley bottoms (3000-3200') to about 5500 feet elevation. Westward, on comparable mountain slopes in the Kootenai N.F. and in northern Idaho, Pacific maritime conifers (WH, WRC, & GF) become increasingly prevalent, and the AF/Clun h.t. is more restricted in its distribution. The Clintonia union is sparsely represented in the relatively dry regions south and east of Missoula; there, AF/Clun is found mostly along mountain streams.

N.F. vicinity	No. plots	Elev. range
Kootenai	8	3500-5400'
Flathead	50	3100-5900
West Lolo	18	3900-6100
East Lolo	17	4000-5700
Bitterroot	12	4300-6050

2. VEGETATIONAL INDICATORS

Key indicator species are Clintonia uniflora and Galium triflorum; these, especially Galium, are sometimes found in small quantities in drier habitat types, often in moist microsites. Alternate indicators include Coptis occidentalis and Cornus canadensis.

3. PHASES

Considerable variation exists within this habitat type, largely because of its wide geographical and broad elevational distributions. It seems disirable to subdivide the type, and the following 5 phases are recognizable:

a. Vaccinium caespitosum phase

Vaccinium caespitosum &/or Arctostaphylos (combined coverage) are well represented. It is found on broad, moist, gravelly benches mostly in the Flathead N.F. between 3200 and 4200 feet. It grades into DF/Vaca or S/Libo on drier (& warmer?) sites; to AF/Clun-Xete on cooler sites; and to AF/Clun-Amu on wet benches.

b. Xerophyllum tenax phase

Menziesia poorly represented; Xerophyllum well represented, or Vaccinium membranaceum well represented and moist-site forbs poorly represented in both species composition and total coverage. (These

include:
Clintonia, Galium triflorum, Actaea, Coptis, Cornus canadensis & C. stolonifera, Disporum hookeri, Listera spp., Senecio triangularis, Streptopis, Tiarella, Trillium Veratrum, Viola canadensis & V. glabella.)

It is generally found on south or west-facing slopes with relatively severe insolation, but still considerable moisture. It grades into AF/Xete h.t. on both drier and cooler slopes, and to AF/Clun-Clun or AF/Clun-Mefe on moister sites.

N.F. vicinity	No. plots	Elev. range
Kootenai	5	4000-5000'
Flathead	17	3800-5300
West Lolo	9	4460-5900
East Lolo	4	4100-5700
Bitterroot	1	6050

c. Aralia nudicaulis phase

Aralia well represented (at least not scarce); Picea glauca, Betula papyrifera, Melica subulata, Oryzopsis asperifolia, Cornus canadensis, and Linnaea frequently present. Restricted to broad, flat, poorly drained benches or valley bottoms in the Flathead N.F. between 3200 and 4200 feet.

d. Menziesia ferruginea phase

Menziesia well represented. This phase occupies poorly insolated sites on NW. to E-facing slopes between about 4500 and 6100 feet elevation, especially on the Flathead and Lolo N.F. It grades into AF/Mefe h.t. on colder sites. AF/Clun-Mefe is also common in n. Idaho.

e. Clintonia uniflora phase

Other qualifications for phases not met; Clintonia union well represented. This phase is similar to Daubenmire's (1968) AF/Pachistima myrsinites h.t. (which also includes the AF/Clun-Mefe outlined above) and is found on cool, moist benches or N. or E-facing slopes. It is the most common representative of AF/Clun h.t. on the East Lolo and Bitterroot N.F., and is less common in the other forests of northwestern Montana.

4. MANAGEMENT IMPLICATIONS

Judging from site indexes and basal areas in natural stands, it appears that the Clun and Arnu phases are the most productive, followed in order by Mefe, Vaca, and Xete phases.

50-Year Site Indexes

Phase	PP	DF	LP	WL	AF	ES
Vaca	-	-	58 ±6	-	-	-
Xete	-	65 ±13	-	57 ±9	54 ±9	61 ±7
Arnu	-	-	-	68 ±?	-	-
Mefe	-	73 ±12	-	61 ±9	57 ±9	64 ±9
Clun	73 ±18	76 ±7	57 ±17	70 ±12	62 ±10	66 ±8

Abies lasiocarpa/Oplopanax horridum h.t. (AF/devils club)

1. HABITAT

AF/Opho h.t. is restricted to relatively flat sites near streams or springs where the water table remains near the surface all year. Such sites are similar physiographically to those of the WH/Opho h.t. (or Daubenmire's WRC/Opho h.t.) except in occurring at higher elevations and beyond the geographical limits of WRC and WH in Montana.

N.F. vicinity	No. plots	Elev. range
Kootenai	1	4350'
Flathead	4	3600-4500
West Lolo*		
Bitterroot	1	4700

(* = probably occurs there)

2. VEGETATIONAL INDICATORS

Oplopanax horridum well represented, or *Athyrium filix-femina* abundant (covg. greater than 25%) and over two feet tall. The latter situation occurs on similar habitats in the Bitterroot and perhaps Lolo N.F. beyond the range limits of *Oplopanax*. WRC and WH are sometimes present, but do not reproduce nearly so successfully as AF.

3. MANAGEMENT IMPLICATIONS

Although confined to small and isolated habitats, this distinctive streamside type often has great aesthetic potential (e.g., stands at Walton R.S. in Glacier N.P. and Bass Cr. Canyon in the Bitterroot N.F.).

AF/Opho has the highest average basal area (331 ±81 sq.ft./A) of any habitat type in the AF Climax Series. This probably reflects infrequency of fire in these wet sites as well as high productivity. 50-year site indexes for 2 WL trees were 73 and 82; values for 3 ES trees ranged from 71-78. These are among the highest indexes obtained from western Montana habitat types.

Abies lasiocarpa/Vaccinium scoparium h.t.
(AF/whortleberry)

1. HABITAT

AF/Vasc is relatively scarce in the four western Montana forests, and it occurs largely on broad ridges and gentle upper slopes at higher elevations. It occupies a relatively cool, dry upland environment, and becomes more abundant eastward in the Continental Divide country of Montana, and thence south and northward throughout portions of the Rocky Mountains where the continental climatic regime predominates. Conversely, as the Daubenmires (1968) have noted, AF/Vasc becomes rare or is absent westward into northern Idaho, where the oceanic influence on climate is strong.

AF/Vasc commonly grades into DF/Caru-Caru on drier (& warmer?) sites, to AF/Clun-Clun on moist sites and to AF/Lugl-Vasc on colder (higher elevation) sites. Occasionally it may also grade into AF/Xete or sometimes AF/Mefe, but often it occurs on ridges and ranges isolated from areas where AF/Xete and AF/Mefe are found.

N.F. vicinity	No. plots	Elev. range
Kootenai	4	4400-6400'
Flathead	2	3700* & 6150
West Lolo	1	6500
East Lolo	2	6550 & 7450
Bitterroot	-	-

(*an unusual stand on a very dry gravelly bench in the Middle Fork Valley)

2. VEGETATIONAL INDICATORS

Vaccinium scoparium is clearly dominant over Xerophyllum and Vaccinium membranaceum, and combined coverage of the latter two less than 25%. Menziesia usually absent, never well represented; Luzula glabrata absent.

3. MANAGEMENT IMPLICATIONS

Little site-index data are available for AF/Vasc in western Montana, but that which is presented in the Tables indicates that this habitat is generally about the same or slightly more productive for timber growth than AF/Xete. Because it often occurs on gentler slopes than AF/Xete, prevention of soil damage and obtaining regeneration may also be less of a problem than in AF/Xete. Much of the commercial lodgepole pine timberland in southwestern Montana, Wyoming, and Alberta is in the AF/Vasc h.t.

Abies lasiocarpa/Xerophyllum tenax h.t.
(AF/beargrass)

1. HABITAT

AF/Xete forms a major component of the subalpine fir forest zone throughout much of western Montana, where it is found largely between 5000 and 7000 feet on relatively steep and dry slopes that face south or west. It is the driest habitat type within the AF Climax Series, and merges into DF/Caru or DF/Xete on drier (& warmer) slopes, to AF/Clun or AF/Mefe on moister slopes, and to AF/Lugl-Vasc at higher elevations. AF/Xete is also abundant in northern Idaho, although it often gives way there to MH/Xete. It becomes scarce eastward toward the Continental Divide ranges in Montana, giving way to AF/Vasc.

2. VEGETATIONAL INDICATORS

Xerophyllum is well represented, and the combined coverage of it and *Vaccinium membranaceum* is at least codominant with that of *Vaccinium scoparium*. *Menziesia* is poorly represented, *Luzula glabrata* absent.

3. PHASES

Two phases are recognized to differentiate this relatively broad type into cooler and warmer subdivisions.

a. *Calamagrostis rubescens* phase

Calamagrostis rubescens is well represented and/or *Arctostaphylos* is present in this, warmer phase of the type. *Pinus ponderosa* forms a minor seral species only in this phase; while *Picea engelmannii* is rarely present and grows poorly. This phase is commonest on the Bitterroot N.F. and scarce in the wetter mountain ranges of northwestern Montana. It grades into DF/Caru-Caru or DF/Xete on drier sites.

N.F. vicinity	No. plots	Elev. range
Kootenai	2	4900-5100'
Flathead	1	5000
West Lolo	1	5750
East Lolo	2	4100-4700
Bitterroot	5	5280-7080

b. *Xerophyllum tenax* phase

Calamagrostis is poorly represented and *Arctostaphylos* absent in this, cooler phase of AF/Xete. *Pinus ponderosa* is seldom present, while *Picea engelmannii* forms a minor seral species in this phase, which is widespread in western Montana. It grades into AF/Mefe on moister aspects and to AF/Lugl-Vasc at higher elevations.

N.F. vicinity	No. plots	Elev. range
Kootenai	2	5650-5700'
Flathead	6	5300-5900
West Lolo	14	4650-6700
East Lolo	4	5000-6800
Bitterroot	5	6380-7380

4. MANAGEMENT IMPLICATIONS

Basal area and site index data indicate that AF/Xete is the least productive habitat type (except for the high-elevation AF/Lugl h.t.) in the AF Climax Series. Relatively steep slopes and severe insolation may also make timber management difficult. The Xete phase is apparently too cold for PP and the Caru phase is apparently too dry for ES.

	50-Year Site Indexes					
	PP	DF	LP	WL	AF	ES
Caru phase	48 ±?	52 ±11	46 ±7	53 ±?	38 ±9	-
Xete phase	-	53 ±5	41 ±4	48 ±11	43 ±6	53 ±?

Tsuga mertensiana/Xerophyllum tenax h.t. (MH/beargrass)

1. HABITAT

MH/Xete occurs only sparingly in Montana. It is found above 5500 feet elevation on warmer aspects near the Idaho-Montana Divide in the western portion of the Lolo N.F. as well as on the mountains north of Thompson Falls. It is apparently rather well represented on warm aspects in the moist mountain ranges of northern Idaho; however eastward from the Idaho-Montana Divide comparable slopes are usually dominated by AF/Xete h.t. Cooler aspects and moister slopes tend to have MH/Mefe adjoining the MH/Xete.

2. VEGETATIONAL INDICATORS

Tsuga mertensiana is codominant or dominant in relation to Abies lasiocarpa and is reproducing successfully. Xerophyllum is well represented; Menziesia poorly represented; Luzula glabrata absent. (Stands of MH having Luzula should be lumped in with the AF/Lugl h.t. according to this classification.)

3. MANAGEMENT IMPLICATIONS

Site index data are lacking, but it seems probable that MH/Xete is at least as productive and perhaps slightly more productive than AF/Xete h.t., Xete phase. While DF is listed as a major seral species in both phases of the AF/Xete h.t., it was found to be only an accidental in MH/Xete in Montana.

Abies lasiocarpa/Menziesia ferruginea h.t. (AF/Menziesia)

1. HABITAT

AF/Mefe covers extensive areas of the cool and moist subalpine fir forest zone in northwestern Montana. It dominates cool aspects, and even the moist slopes on warmer aspects, between about 5500 and 6500 feet elevations in the regions lying north or west from Missoula. South or east from Missoula it occurs mostly between 6000 and 7200 feet. The upper (cold) limits of the type are defined by the presence of Luzula glabrata (woodrush) and thus the AF/Lugl h.t., Mefe phase, and the lower limits are indicated by the Clintonia union (usually AF/Clun-Mefe). Drier slopes are dominated by AF/Xete, and this type sometimes forms broad ecotones with AF/Mefe on relatively uniform slopes.

N.F. vicinity	No. plots	Elev. range
Kootenai	2	5700-5750'
Flathead	2	5450-5850'
West Lolo	15	5350-6100
East Lolo	9	5700-7200
Bitterroot	8	6000-7140

2. VEGETATIONAL INDICATORS

Menziesia is well represented; neither the Clintonia union nor Luzula glabrata present.

3. MANAGEMENT IMPLICATIONS

Site index data suggests that AF/Mefe is a relatively productive habitat type for several conifer species. When stands are opened extensively, Menziesia, Alnus sinuata, and other shrubs form a brushfield that retards establishment of a new forest.

Daubenmires' (1968) AF/Mefe h.t. has been split into AF/Mefe and AF/Lugl-Mefe in this Montana classification. The AF/Mefe h.t. generally has moderate potential for tree growth, while as a rule AF/Lugl does not.

Tsuga mertensiana/Menziesia ferruginea h.t. (MH/Menziesia)

1. HABITAT

MH/Mefe is probably the commonest habitat type dominated by Tsuga mertensiana. Even so, it is largely restricted to portions of the West Lolo N.F. on moist slopes above 5500 feet. The same type is much more prevalent in northern Idaho, but the Daubenmires' (1968) MH/Mefe h.t., defined for that region, also includes high-elevation habitats with Luzula glabrata that would be designated as AF/Lugl-Mefe in the Montana classification.

2. VEGETATIONAL INDICATORS

Tsuga mertensiana codominant or dominant in relation to Abies lasiocarpa and reproducing successfully. Menziesia well represented and Luzula glabrata absent.

3. MANAGEMENT IMPLICATIONS

No site index data are available for this habitat type; however it is probably similar to AF/Mefe. DF is relatively scarce in the MH/Mefe h.t. although it is a common seral species in AF/Mefe.

Abies lasiocarpa/Luzula glabrata h.t.
(AF/woodrush)

1. HABITAT

AF/Lugl is the highest subalpine forest habitat type, and is bounded above by the Timberline Climax Series. It covers all exposures and may form an elevational zone about 1000 feet wide between AF/Xete, AF/Vasc, or AF/Mefe below and WBP-AF or AL-AF above. This type is probably better developed in Montana than westward in northern Idaho, where there is little high-elevation (7000+ foot) terrain other than extremely exposed and rocky peaks. AF/Lugl is characterized by two to three month growing seasons, and by snowpack that remains on the ground until the latter part of June.

2. VEGETATIONAL INDICATORS

Luzula glabrata is present; sites are usually above the limits of *Pseudotsuga*, *Larix occidentalis*, and *Pinus monticola*, but not above the limits of *Pinus contorta*.

3. PHASES

Two phases are recognized, based upon dominant understory vegetation.

a. *Vaccinium scoparium* phase

Vaccinium scoparium, *V. membranaceum*, and *Xerophyllum* form the dominant understory; *Menziesia* and *Rhododendron* are poorly represented. *Pinus albicaulis* and *Pinus contorta* are major seral species in this phase.

N.F. vicinity	No. plots	Elev. range
Kootenai	2	7000-7250'
Flathead	3	6300-6600
West Lolo	3	6000-6640
East Lolo	4	7120-7800
Bitterroot	10	7250-8600

b. *Menziesia ferruginea* phase

Menziesia (&/or *Rhododendron*) is well represented. *Pinus albicaulis* and *P. contorta* are minor seral species in this phase which is almost entirely restricted to cool (N. & E.) exposures and sheltered basins (cirques). *Larix lyallii* is sometimes present as a seral species (or even as an edaphic climax on talus sites) in this phase.

N.F. vicinity	No. plots	Elev. range
Kootenai	10	5950-6800'
Flathead	5	6250-6600'
West Lolo	- (should be present)	
East Lolo	3	7070-7460
Bitterroot	3	6400-7500

4. MANAGEMENT IMPLICATIONS

It should be noted that this habitat type has too short a growing season for DF, WL, and WP.

	50-Year Site Index				
	LP	AF	ES	MH	WBP
Vasc phase	35 ±6	32 ±6	45 ±15	28 ±?	29 ±8
Mefe phase	-	41 ±10	57 ±10	-	29 ±7

Site index data indicate that the Mefe phase is more productive for ES and AF than the Vasc phase. However, the Mefe phase usually occurs on shallow, rocky soils. Watershed and recreation values may be key considerations in the management of this habitat type.

TIMBERLINE CLIMAX SERIES

1. HABITAT

Timberline habitats are generally characterized by rugged topography and exceedingly shallow, stony soils. The climate is characterized by a growing season approximately two months long and by mean temperatures for July and August only slightly above 50 degrees F. Hard frosts (below 25 deg. F.) occur often enough in the latter part of June or in early or mid-September to damage shoot growth of conifers.

Climatically caused timberline habitats are generally at about 7200-7800 feet in the Kootenai, Flathead, and West Lolo N.F.s and between about 7500 and 8500 feet on the East Lolo and Bitterroot. Above this is a narrow belt of alpine scrub or "krummholz" and then alpine tundra vegetation. Only four tree species--Larix lyallii, Pinus albicaulis, Picea engelmannii, and Abies lasiocarpa--typically survive here.

Blizzard conditions occur commonly in all months except July and August. Even during the brief growing season winds of whole gale or hurricane velocity are not rare. Snow accumulations are so great in this habitat that most of the steeper slopes are subject to snow-slides or avalanche. Snowdrifts persist so late into summer during some years that they hinder plant growth. Exceptionally wind-exposed sites within the timberline zone are swept free of snow all winter; here, deep soil frost, winter and summer drought, extensive temperature fluctuations, and the mechanical damage caused by winds combine to inhibit tree growth.

2. VEGETATIONAL INDICATORS

Timberline is the transitional zone between forest and alpine, where trees take on many life forms and the vegetation forms an intricate mosiac. Trees tend to grow in groups or clusters with meadowy glades in between. Abies lasiocarpa is noticeably stunted or wind-deformed, sometimes shrub-like, or often with shrubby skirts, and reproducing frequently through layered branches. Sites are generally above the cold limits of Pinus contorta, Menziesia, and Rhododendron.

3. HABITAT TYPES

This climax series has been divided into two habitat types.

a. WBP-AF h.t.

This "wind-timber" habitat type is widely distributed at timberline throughout much of the Northern Rockies. It is

confined to tiny areas on the very highest ridges and peaks in northern Idaho, but is much more common eastward into Montana because of more extensive high-elevation terrain. The vegetation is characterized by varying amounts of Pinus albicaulis and Abies lasiocarpa and by undergrowth dominated by combinations of Vaccinium scoparium, Luzula glabrata, Phyllodoce empetriformis, and P. glanduliflora. Stands are usually quite open in appearance and competition related to tolerance is less evident than in lower habitat types.

b. AL-AF h.t.

Larix lyallii (alpine larch) is a long-lived dominant species on this habitat. (Because of the rigorous climate, rugged topography, and scant soil development at timberline, "climax" relationships are frequently unclear.) This hardy, deciduous conifer, which is highly intolerant of shade, forms groves in sites that are beyond the "tree limits" of evergreen conifers, especially on cool aspects. The undergrowth of this type is dominated by Phyllodoce spp., Luzula glabrata, Vaccinium scoparium, and shrublike Abies lasiocarpa. This habitat type is largely confined to the highest elevations of the Cabinet, Whitefish, Swan, Mission, Bitterroot, Anaconda-Pintlar, and Flint Creek Range in western Montana.

4. MANAGEMENT IMPLICATIONS

Timberline habitats have high values for watershed, recreation, and summer range for various species of wildlife. The vegetation can support very little concentrated use by campers, domestic stock, or developments.

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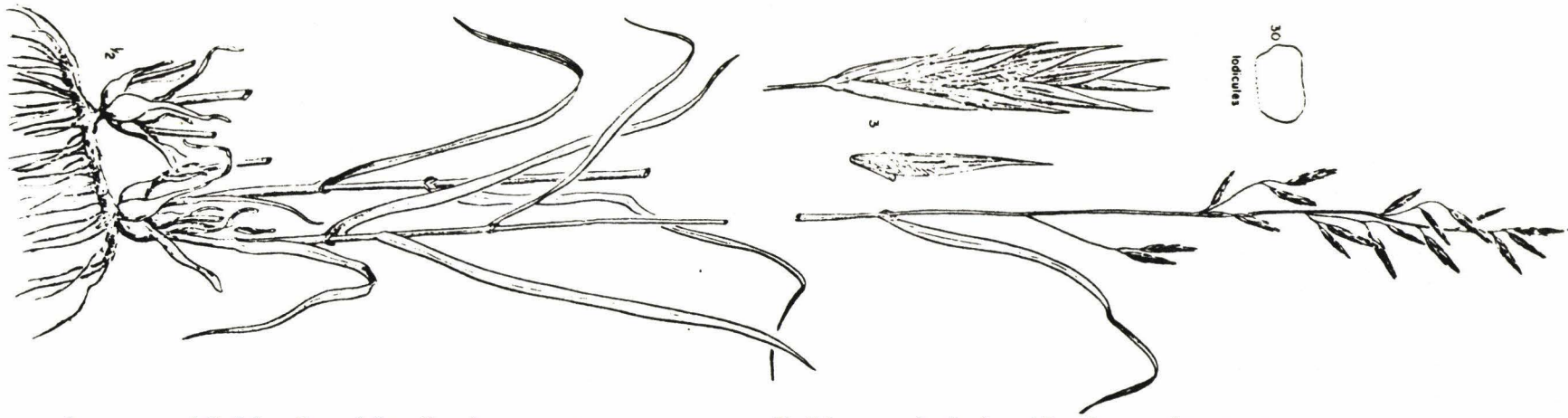
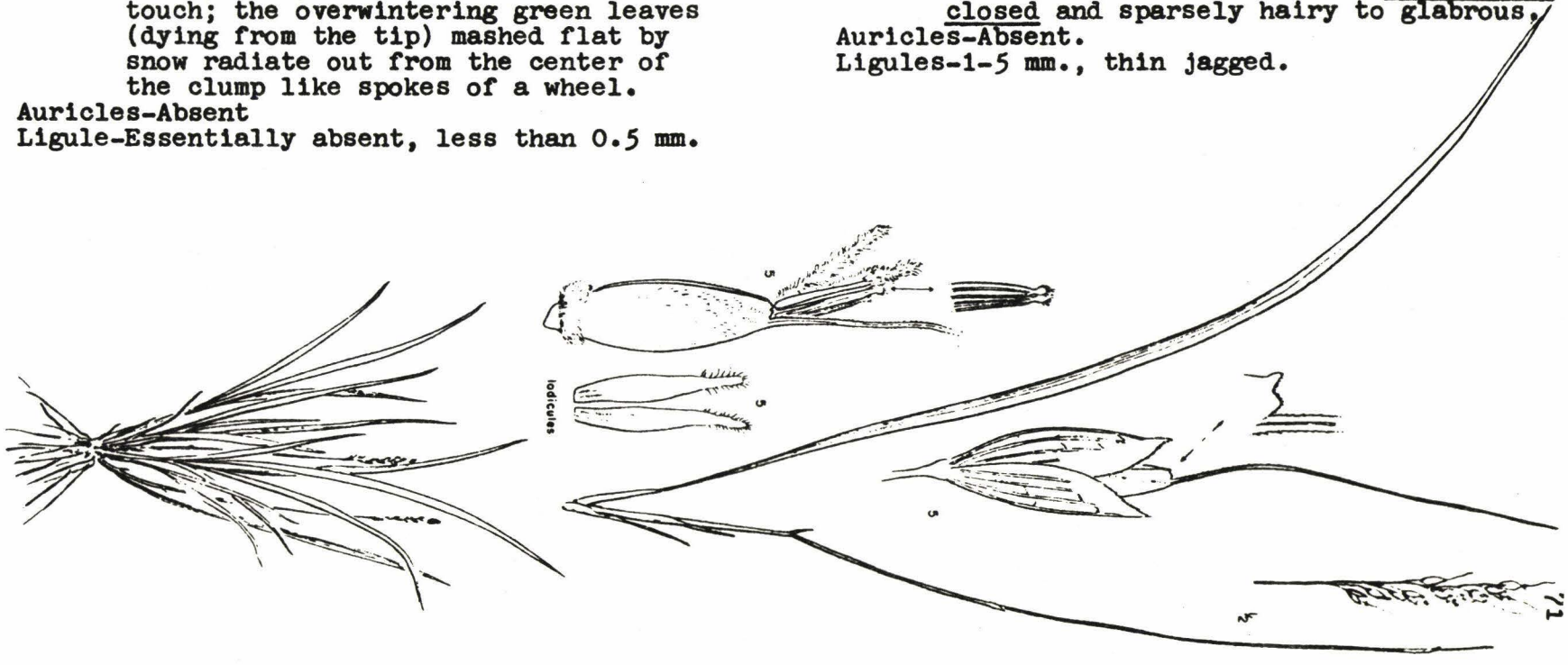
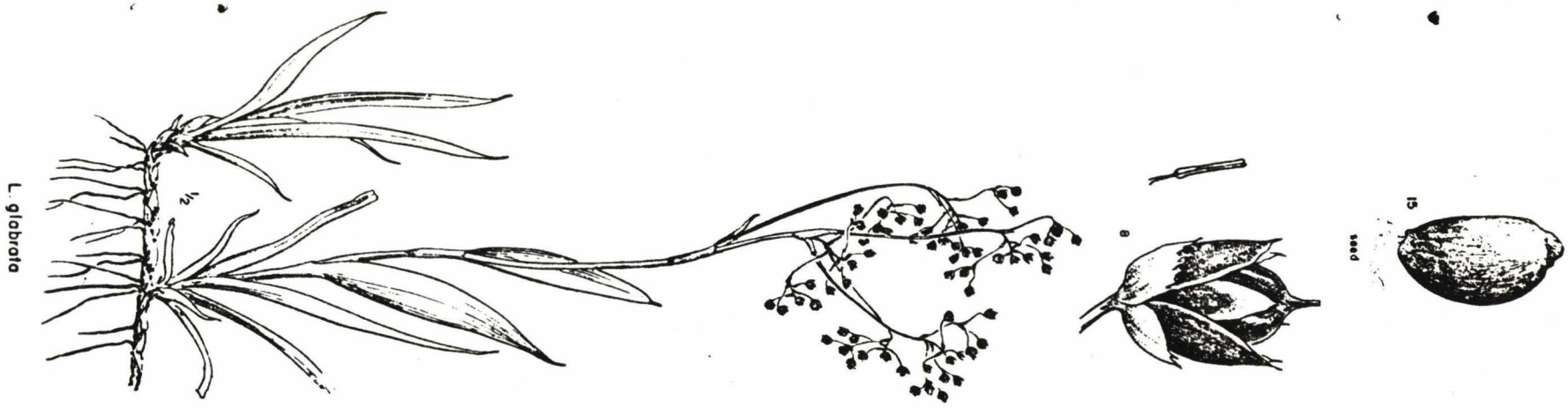


Oryzopsis asperifolia-Roughleaf ricegrass
Habit-Tufted perennial grass of moist forests.
Inflorescence-Narrow spike-like appearing panicle, one floret per spikelet, lemma awned from the tip.
Culms-Erect up to 1½ ft. tall.
Leaves-Broad, flat, stiff and rough to the touch; the overwintering green leaves (dying from the tip) mashed flat by snow radiate out from the center of the clump like spokes of a wheel.
Auricles-Absent
Ligule-Essentially absent, less than 0.5 mm.

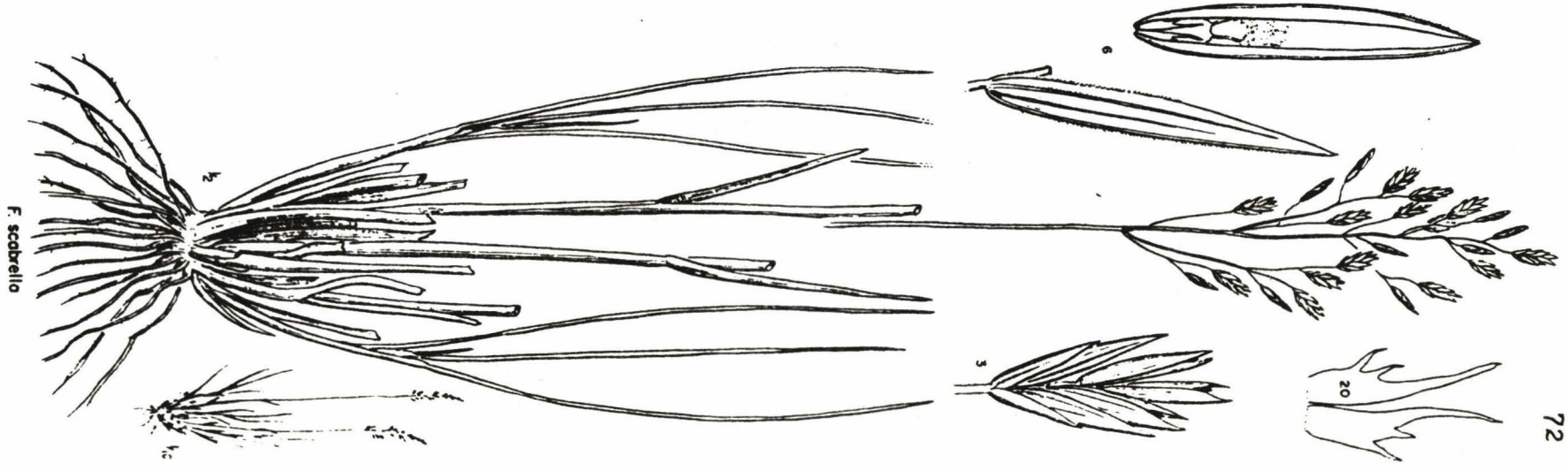
Melica subulata-Alaska oniongrass
Habit-Tufted perennial grass with short thick rhizomes.
Culms-Erect, slender, with a bulbous base up to 2½ ft. tall.
Inflorescence-Loose panicle, lemma pointed.
Leaves-Flat and relatively narrow; leaf sheath closed and sparsely hairy to glabrous.
Auricles-Absent.
Ligules-1-5 mm., thin jagged.

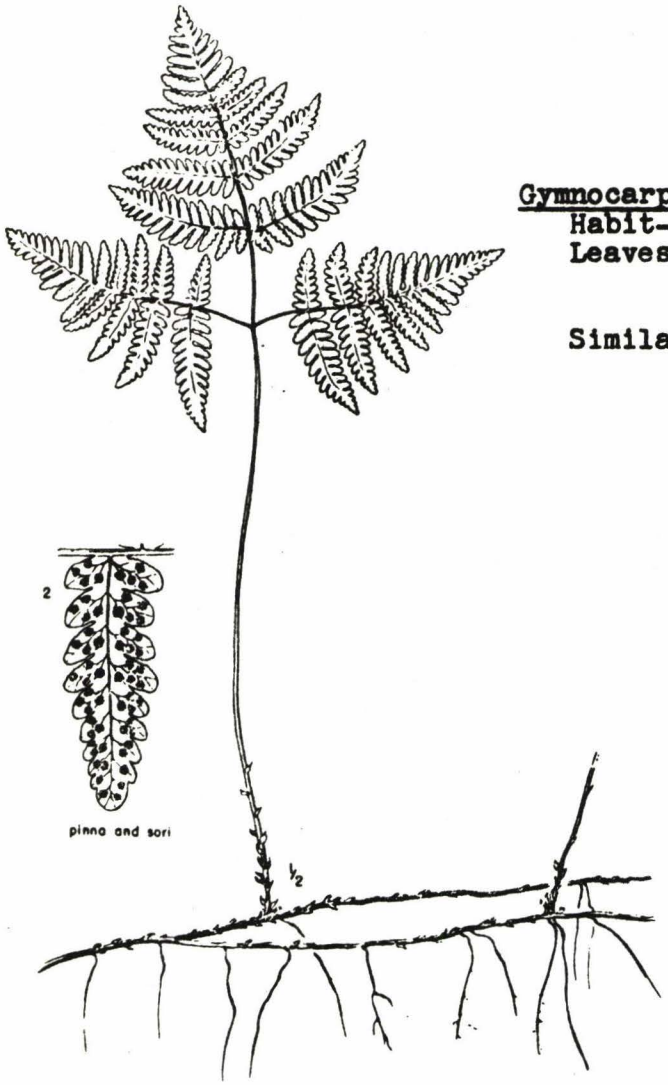




Luzula glabrata-Wood rush
Habit-Perennial, rhizomatous grass-like plant up to 1½ ft. tall.
Leaves-Shiny to glossy, bright green with tips often reddish brown flattened.
Flowers-Small, inconspicuous, rush-like in flat topped clusters above the leaves.
Similar species-L. parviflora-dull green foliage & flowers drooping.

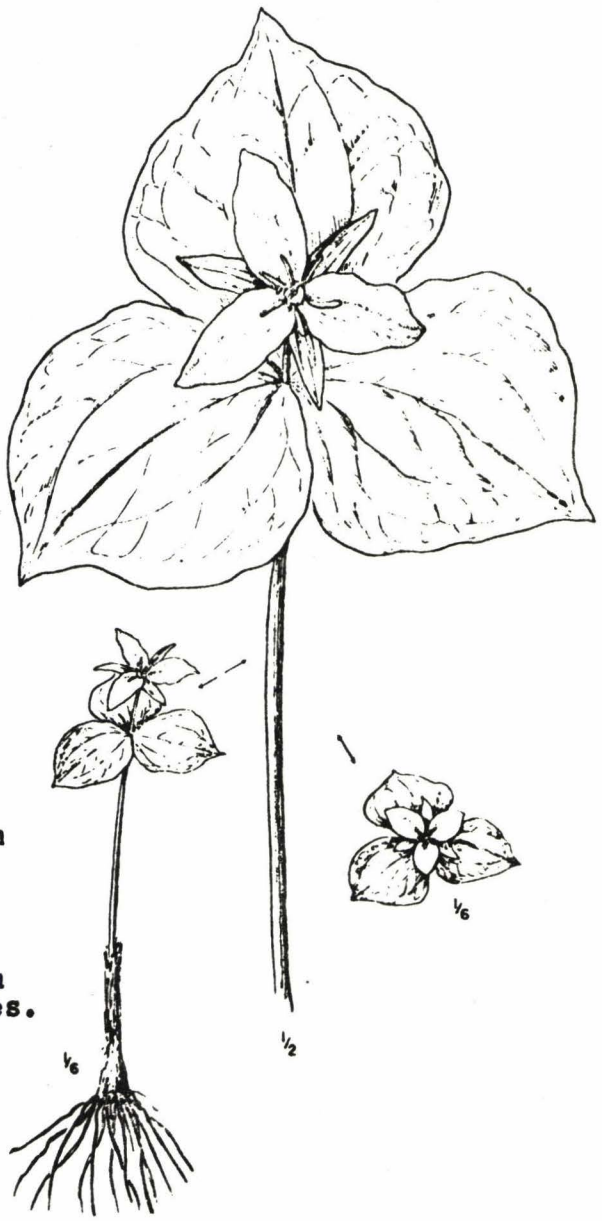
Festuca scabrella-Rough fescue
Habit-Large, robust, bunchgrass;flowering stems & heads 2-3½ ft. tall.
Inflorescence-Semiopen panicle, lemma pointed but not awned.
Culms-Erect, showing no nodes (key character).
Leaves-Usually tightly rolled to appear round rather than flat.
Auricles-Lacking
Ligules-Very short, 0.5 mm. or less.





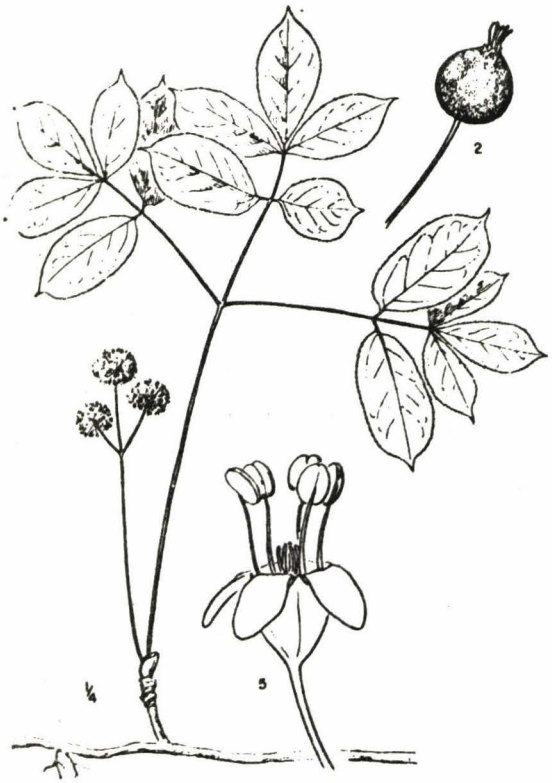
Gymnocarpium dryopteris

Gymnocarpium dryopteris-Oak fern
Habit-Perennial, rhizomatose fern up to 8".
Leaves-Fronds doubly compound, appear to be composed of 3 compound leaflets that parallel the ground surface.
Similar species-A very distinct fern, not readily confused with other ferns.



Trillium ovatum

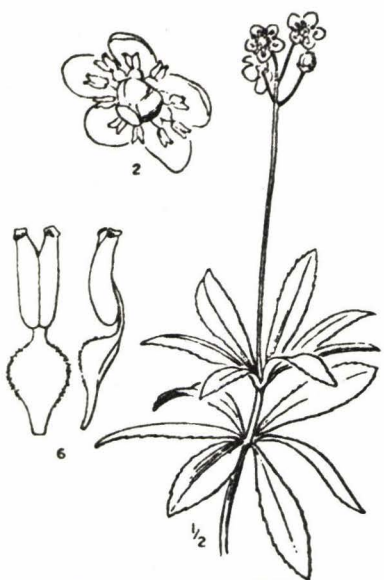
Trillium ovatum-Trillium
Habit-Perennial from a deep seated corm up to 16" tall.
Leaves-3, sessil, borne at the top of the stem.
Flowers-Solitary, single parts in 3's, white, turning pink to purplish with age, borne above the leaves.



Aralia nudicaulis

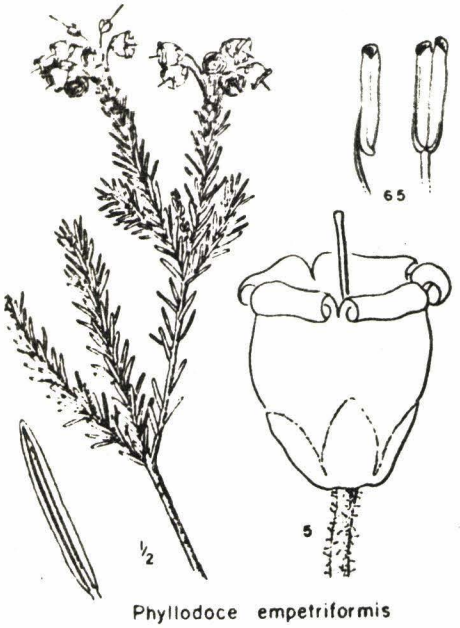
Aralia nudicaulis-Wild sarsaparilla
Habit-Perennial rhizomatous forb up to 1½ ft. tall.
Leaves-Compound, distinct.
Flowers-Greenish white, small & inconspicuous in ball-shaped umbels.
Fruit-Dark purple berry.

Balsamorhiza sagittata-Arrowleaf balsamroot
Habit-Perennial, very stout taproot forb up to 1½ ft. tall.
Leaves-Large arrowhead shaped from a basal cluster.
Flowers-Yellow-orange, sunflower-like flower stalks from basal clump.

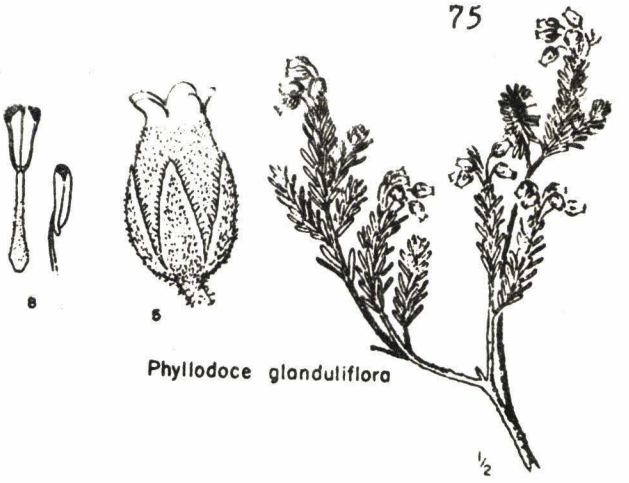


Chimaphila umbellata

Chimaphila umbellata-Prince's pine
Habit-Perennial, rhizomatous evergreen herb up to 1 ft. tall.
Leaves-Dark green, leathery, evergreen, widest near their tip, crowded into whorls.
Flowers-Pink, nodding on terminal flower stalk.



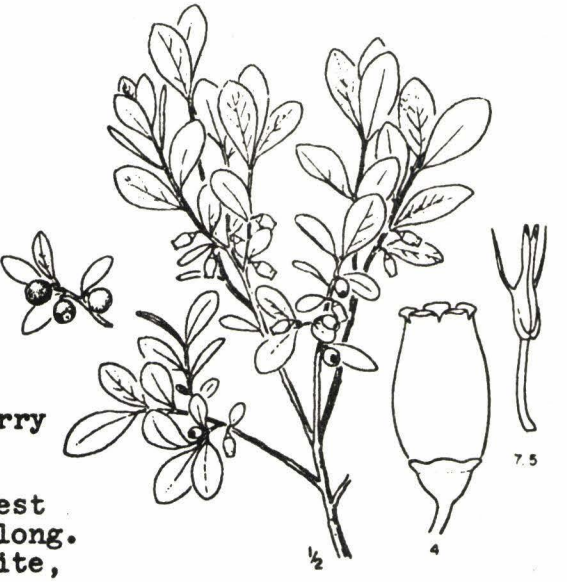
Phyllodoce empetriformis



Phyllodoce glanduliflora

Phyllodoce glanduliflora-Yellow mtn. heath
Differing from P. empetriformis in the following characters:
Leaves-Shorter & broader; the groove white-hairy.
Flowers-Pale yellow to cream white & urn shaped.

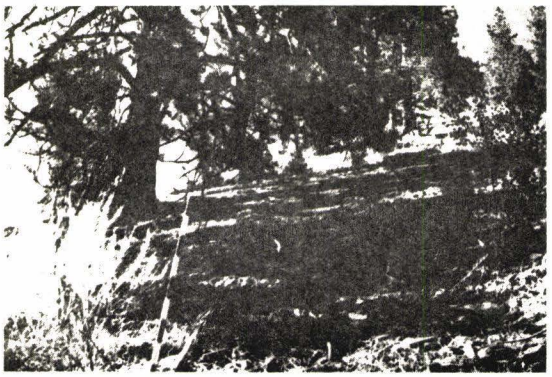
Phyllodoce empetriformis-Red mountain heath
Habit-Low mat-forming shrub 6-18" tall
Leaves-Alternate, evergreen, fir-needlelike, linear with groove on undersurface.
Flowers-Bright red violet, bell shape.
Fruit-Dry, slightly woody persistent capsule.
Stem-Brown to grayish.
Field recognition-Appears as a prostrate miniture conifer.



V. caespitosum

Vaccinium caespitosum-Dwarf huckleberry
Habit-Dwarf to low mat-forming shrub.
Leaves-Alternate, deciduous, widest above the middle, 1-3 cm. long.
Flowers-Pale pink to greenish white, small, 5-6 mm.
Fruit-Bluish berry, 5-8 mm.
Stem-Rounded in cross section

PHOTOGRAPHS OF HABITAT TYPES



PINUS PONDEROSA &-or PSEUDOTSUGA/
"Scree" h.t.

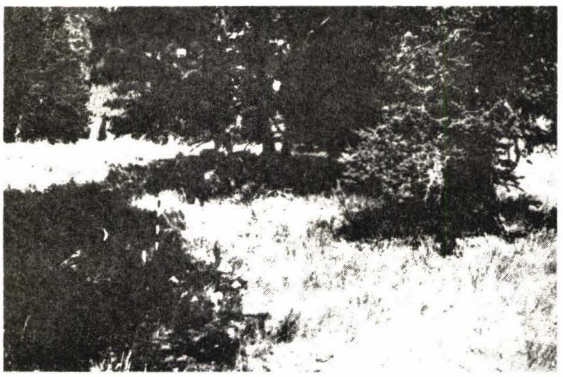
PINUS PONDEROSA/Agropyron spicatum h.t.

PINUS PONDEROSA/ Festuca idahoensis h.t

PINUS PONDEROSA/ Purshia tridentata h.t.

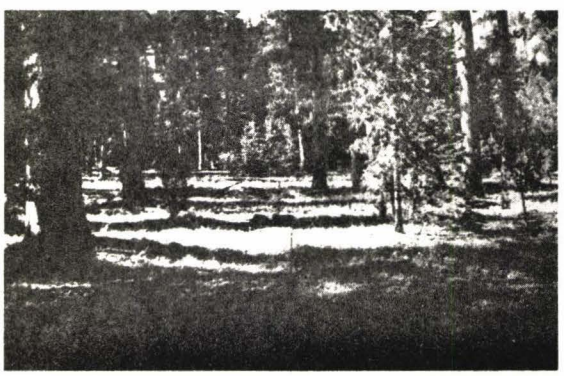
PINUS PONDEROSA/Symphoricarpos albus h.t.

PINUS PONDEROSA/ Calamagrostis
rubescens h.t



PSEUDOTSUGA MENZIESII/
Agropyron spicatum h.t.

PSEUDOTSUGA MENZIESII/
Calamagrostis rubescens h.t.



PSEUDOTSUGA MENZIESII/
Arctostaphylos uva-ursi h.t.

PSEUDOTSUGA MENZIESII/
Vaccinium caespitosum h.t.

PSEUDOTSUGA MENZIESII/
Symphoricarpos albus h.t.

PSEUDOTSUGA MENZIESII/
Physocarpus malvaceus h.t.

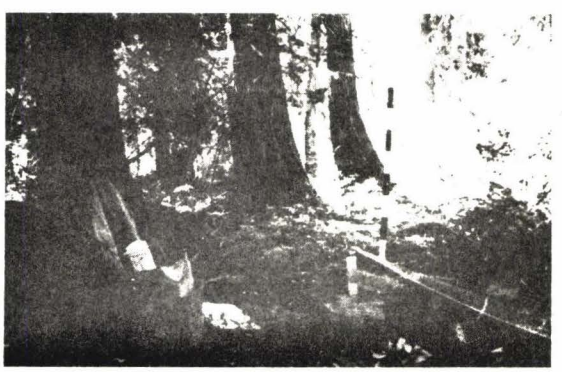
PSEUDOTSUGA MENZIESII/
Linnaea borealis h.t.

PSEUDOTSUGA MENZIESII/
Xerophyllum tenax h.t.

PICEA/Linnaea borealis h.t.

ABIES GRANDIS/Clintonia uniflora h.t.

ABIES GRANDIS/Xerophyllum tenax h.t.



THUJA PLICATA/Clintonia uniflora h.t.

TSUGA HETEROPHYLLA/Clintonia uniflora h.t

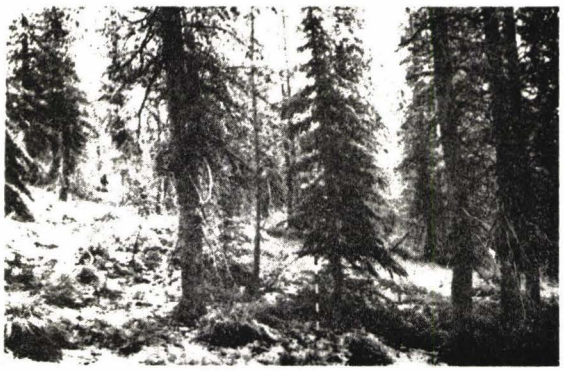
TSUGA HETEROPHYLLA/Oplopanax horridum h.t

ABIES LASIOCARPA/Oplopanax horridum h.t.

ABIES LASIOCARPA/Clintonia uniflora h.t.

ABIES LASIOCARPA/Vaccinium scoparium h.t.

ABIES LASIOCARPA/Xerophyllum tenax h.t.

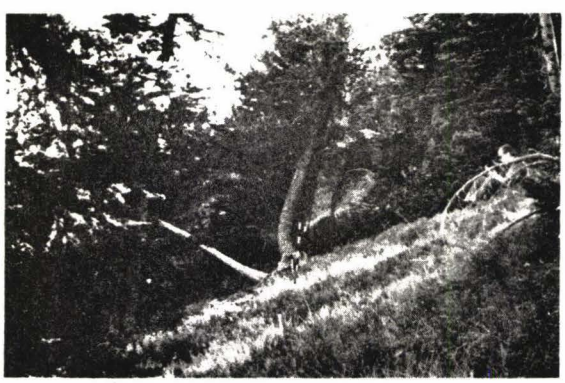


TSUGA MERTENSIANA/Xerophyllum tenax h.t.

ABIES LASIOCARPA/Menziesia ferruginea h.t.

TSUGA MERTENSIANA/
Menziesia ferruginea h.t.

ABIES LASIOCARPA/Luzula glabrata h.t.



PINUS ALBICAULIS - ABIES LASIOCARPA h.t.